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A PROJECT IN EDUCATIONAL ANALYSIS AND PLANNING

CHARLES E. FRILEY, ALBERT L. WALKER and HAROLD V. GASKILL
Iowa State College

Editor's Note: More and more people seem to feel that the school's purposes and program of activities should be reassessed in light of current trends and possibilities. The authors of this paper present a review of procedures employed by a group of faculty members of the Science Division of Iowa State College, in educational analysis and planning.

THE people of the United States are now united in an effort to attain a major goal accepted by the whole of society—the winning of the war. Most institutions are examining critically the relationship between their own activities and purposes and the attainment of this goal. This process of intensive self-appraisal in the light of society's great purposes will continue after the war, and it should continue. Educational institutions are finding it necessary to reexamine both their purposes and their methods. The need for such reexamination, after the war, will be acute.

But the process of relating individual or institutional purposes to the great major goals of society will not be easy after the war. New difficulties will arise. When the single goal which now unites society has been reached, other unifying goals will have to be reaffirmed and redefined, goals to which all individuals and groups in a peaceful but dynamic society can give their approval. These goals must represent the great *common needs* which all people share, which hold people together *in spite of conflicts of other interests*. These goals will be less easy to define specifically than is the single goal which now dominates our action. The very need to have such basic common goals will not be apparent to everyone. Even if general agreements concerning common goals exist or seem to exist—agreement, for example, on the need for a peaceful world, or the need for freedom from want and fear—difficulties will occur as fast as specific means of implementation are suggested. It will be easier than it is now for individuals and groups to win

public approval for measures which do not in fact advance the public good. Every specific measure will help some groups more than it helps other, at least in its immediate effects. Some measures which will not produce immediate rewards will require public and congressional support over a period of years.

Fears of proposed international or domestic measures will be easy to arouse, for some of these measures will necessarily be experimental, and fear of the untried lies deep in all of us. Some post-war arrangements must rest on mutual trust between groups and between nations, but distrust and suspicion are hard to avoid. Leaders who are more interested in public support than in public service will make the most of emotions and fears and conflicts of interest. Society, in short, will face a problem in self-control far more difficult than that imposed by war. Our ability to choose sound goals and to select wise leaders will be tested as never before. Education will have its greatest opportunity.

The need for a general education which will prepare the individual for his part in creating and maintaining a peaceful society has been expressed by leaders in many fields, as well as by the representatives of education. Fears have been expressed that technical training will receive an emphasis now which will carry over into post-war education and result in the production of high-school or college graduates whose chief distinguishing characteristic is sharp economic teeth. Yet, weakly countering, many of the spokesmen for general education have produced distressingly general descriptions of the purposes and the methods of that education. Though one may be inclined to doubt that American education since 1920 has been a "failure," as is often charged, one may suspect that many of the demonstrated weaknesses of "general" or "liberal" education arise from a lack of specificity in the educators' purposes. We need highly specific descriptions now, for use as guides to our planning.

The task of specific description is never simple. It is difficult psychologically, for it involves the reconsideration of matters which many persons have considered settled. When once developed, specific descriptions of purpose are hard to use, for they sometimes necessitate changes in long-familiar procedures.

The members of the faculty of the Division of Science[1] in the Iowa State College are now in the second stage of a project in educational analysis and planning designed to prepare both teachers and administrators to recognize and meet the many problems and opportunities which will arise after the war in both general and technical education.[2] The first stage of this project consisted mainly of the work of a new divisional curriculum committee, which was appointed in the fall of 1941 with the request that it attempt to develop, over a period of time, a clear description of possible purposes and methods in general and technical education in the light of which specific plans might be made.[3] The following brief account of the results of the first stage of this work and of the plans for future work may be useful to persons in other colleges. The work of this committee has, of course, many implications for college administration, some of which will be mentioned in this discussion.

Early in its discussions, the Committee discovered the need to answer the following questions:

(1) What are the actual purposes and achievements of existing courses of study and agencies within the Division?
(2) What are the inter-relationships of these courses or agencies (both inter-departmental and inter-divisional)?

But the Committee realized also that the possession of such information would be only a preliminary to another problem, the problem of developing

[1] The work of the Iowa State College is administered through five major divisions (Agriculture, Engineering, Home Economics, Science, Veterinary Medicine), a Junior College, a Graduate College, and Agricultural and Engineering Experiment Stations, Industrial Science Research Institute and Veterinary Research Institute, and Extension Services. The Division of Science, which includes the Industrial Science Research Institute, offers major work in some thirty-five fields of science, and is responsible for both elementary and advanced work in the sciences, the social studies, and the humanities. Its elementary courses serve many of the purposes of general education.

[2] For the purposes of this discussion general education may be defined as that education needed by all persons regardless of their special fields of work; it may be taken to include (a) basic knowledge or skill needed in all fields of work (b) education needed for personal living, (c) education needed for citizenship. Liberal education may be viewed in its elementary phase as general education; in its advanced phase, it would include specialized work in the traditional fields of liberal study.

[3] Four other divisional committees and a new general curriculum committee were also appointed in September, 1941. The new committee in the Division of Science is composed of amateurs, in the sense that no member has had special training in administration, has a specialized knowledge of curricular problems, or has served earlier on such a committee. Subject matter fields represented are Botany, Chemistry, Economics and Sociology, English and Speech, Geology, History and Government, Mathematics, Physics, and Zoology and Entomology.

a point of view in the light of which existing arrangements or proposed changes in arrangements may be evaluated. Without the application of such a point of view, any curriculum is likely to become a patchwork of courses, the basic pattern of which is not apparent simply because no pattern exists. Without such a point of view, a curriculum committee—or the college itself—is more subject than it should be to pressures exerted by individuals or groups, within the college or without.

The members of the Committee realized clearly that any such basic educational philosophy, if it is to become effective in terms of actual classroom practice, should represent ultimately the best thought of everyone concerned with the problems involved. These problems range from highly general concepts of educational purpose, which should be understood and approved by a whole faculty, to highly specific problems of purpose or method, which should be understood and approved by the individual teachers, committees, and administrators concerned. The members believed, further, that many phases of the work of the Division, including the purposes and relationships of many courses and agencies, should be made clear to the *students*. With these beliefs in mind, the members agreed to spend whatever time would be necessary (1) to develop a point of view among themselves, (2) to explain that point of view to the faculty and the administration, (3) in so far as necessary, to modify that point of view in the light of discussion, with the aim of securing a genuine agreement on fundamentals, and (4) to foster the application of that point of view in the work of this Division, subject always to revisions suggested by experience.

The preliminary agreement among the members of the Committee on a *way of thinking about education* and on many basic assumptions as to educational purpose and method was published in October, 1942, in the form of a large and detailed chart called "An Analysis of Educational Objectives." On the left-hand side of this chart, from top to bottom, appear the names of general areas of experience with which every student is concerned at some time during his life in college or after graduation:

I. Life Work

A. Choice of Life Work
B. Development of Competence in a Chosen Field
C. Basic General Economic Behavior

II. Personal Development
- A. Personal Health
- B. Mental Health and Social Adjustment
- C. Personal Appearance and Behavior
- D. Philosophy of Life—Pattern of Values (Religion; Ethics)

III. Development as Citizen

Opposite each of these headings, from left to right, are (1) a list of specific *activities* which people commonly perform in the area of experience named (2) a list of the general *goals* or *purposes* of these activities and (3) a list of the *problems* or *difficulties* which people commonly encounter in their efforts to attain their goals. All of these items together constitute a realistic picture of the probable life activities of the individual in the various areas of his experience. Opposite these items, in other columns at the right, appear specific types of *knowledge,* or *belief* or *attitude,* of *interest* or *appreciation,* and of *ability* or *skill* which the individual may need in solving his problems and which a college may wish to aid him in developing.

One advantage of this type of analysis[4] is the fact that the possible purposes of education are shown *in relation to one another.* Another advantage is the ease with which the analysis reveals the constributions of various fields of learning to common educational purposes. Another advantage is the shift in emphasis from *subject matter as an end in itself* to subject matter as a *means* used for *specific ends.* A still greater advantage is the fact that this method of analysis challenges those responsible for teaching to define their purposes specifically and functionally, in terms of the results of education in the behavior[5] of the educated. It is at this point that so many of the spokesmen for general or liberal education become vague. Almost all colleges promise, in their catalogs, a contribution to general education, which is frequently described further as Citizenship, as Philosophy of Life, or as Personal Development. But how many colleges are prepared to make the specific contributions which a democratic society now needs? Some persons, unconsciously perhaps, avoid the issue of specific definition of purpose by saying that this training is supplied by the home and the church, a statement

[4] Obviously, this method of analysis, in its general features, is not an original creation of our Committee. The specific applications of the method and certain emphases—especially the emphasis on the function of the individual student's goals—are the Committee's own.

[5] As used here, the term 'behavior refers to purposes, beliefs, and attitudes, as well as to overt activity.

which is certainly true in part, or by saying that such things as citizenship are in their nature so vague, so intangible, that they must be absorbed from the environment and cannot be fostered in any deliberate way by an institution of higher learning. Some persons believe, apparently, that preparation for citizenship or for the good life will occur as an intangible process while the student reads books (and this, again, is certainly true in part.) Some persons would have the student concentrate his attention on the "great books" of the past, to the relative neglect of the impact of *modern* social science or history or philosophy or literature, and to the relative neglect of the *discipline* of seeing clearly and evaluating the forces now at work in our society. It should be sufficient to observe here that all of these arguments concern the *means* of education. They afford a convenient refuge when specific definition of *ends* seems too difficult or too likely to upset the academic *status quo*. Even if it be urged that the *end* of such a general education as that devoted to the study of the "great books" of the past is the ability to think, which is a very worthy thing indeed, one may still be inclined to ask "Think about *what*, and to *what end?*" If the answer is "Think about the problems of the individual and the group in contemporary democratic society, to the end that the individual may choose sound goals and help preserve our institutions and our way of life," then one may legitimately discuss *means*, and one may then be inclined to question the completeness or the adequacy of a general education which neglects modern insights in any field of learning.

As a beginning in its functional definition of educational purposes in the general area of Citizenship, then, the Committee recorded the fact that large numbers of people in our society engage in such *activities* as the following:

> The citizen develops beliefs and wishes concerning social policies. He influences the behavior of others by conversation, by discussions, by writing, by joining organizations, by working in elections, by giving money to various groups, by acting as a leader in various situations, by acting as a member of various interest groups (see I, C, and III), by voting, by running for office, by holding public or private positions which enable him to influence opinion and policy. He also influences the behavior of others by doing none of these things—by being indifferent to the whole realm of government and policy making.
>
> The citizen reads, listens, acquires information or beliefs critically or uncritically. He makes many small decisions having social implications. He acts occasionally in the administration of justice.

The goals which people hold in common in this area are stated as follows:[6]

The citizen wants a society in which the methods and processes of democracy—free speech, a free press, public and private education, a secret ballot, a representative government, impartial tribunals—are used for adjusting the demands of various groups in such a way as to secure the rights and meet the legitimate needs of all individuals without recourse to violence or suppression.

In attempting to reach their goals in this area, individuals and groups in society experience such difficulties as the following:

The citizen experiences the difficulty of obtaining unbiased information; of evaluating facts from a social point of view when individual self-interest is involved; of thinking in terms of long-run rather than immediate results; of evaluating the needs and rights of all groups in society; of finding time and energy to consider social problems when individual needs are urgent.

A basic problem of our time is that of overcoming the tremendous negative force of inertia or apathy, by means of instruction and experience which will lead the citizen to understand the connections between his behavior and the quality of the society in which he will live. Another basic problem is that of effecting desirable adjustments of conflicts of interest by democratic means and for democratic ends. This age-old problem arises from the need to combine individual freedom with necessary degrees of social restraint.

In order to choose wisely and attain his goals, the college student may need to secure by means of education *knowledge, beliefs* or *attitudes, interests* or *appreciations,* and *abilities* or *skills* such as the following:

The student understands the American way of life in *functional* terms. He knows the strengths and weaknesses, and therefore the *needs,* of a democratic society; he knows the differences between democracy and other systems. He knows the functions of leadership in a democracy. He knows the function of the specialist and of the well informed citizen in the development of social policy. He knows the basic conditions of social peace. He knows the

[6] Major goals named in the analytical chart are of two kinds: (1) goals whose importance is obvious to most informed persons, such as economic security, health, etc., and (2) goals whose attainment—in the considered judgment of the college—is necessary for the good of the individual and the good of society. The values of a democratic society are assumed. The inclusion of the second type of goal rests on the assumption that a college should exert a proper degree of leadership, however painstaking its study of the desires of those it serves. A college cannot avoid value judgments any more than can an individual or a society. The educational planner should know the value judgments upon which his plan rests.

basic factors in the behavior of groups and institutions. He knows the specific social problems of our day. He knows how his own opinions and group opinions are formed. He knows methods of careful thought about social policy. He knows specific ways in which he can contribute to the development of social policy.

The student has the interests suggested by the activities, goals, and difficulties in this area. Because of these interests, he knows from day to day at least some of the problems of society and some of the efforts which are being made to solve them. Because of these interests, he makes at least some specific contributions of his own.

The student realizes that his own beliefs are important because of their effect on his own behavior and on other people. He believes that the individual citizen *can* contribute to the development of social policy, especially in the realm of judgments concerning value or equity. He believes that the solution of such problems is vital to his welfare. He tends to look for and emphasize the things which individuals and groups have in common as a step toward rational settlement of differences. He believes that the discovery and *recognition* of common interests is basic in developing social agreements. He believes that individuals in society have both rights and duties. He tends to have a critical attitude toward gossip, rumor, and all forms of persuasion. He tends to analyze and tries to control the emotional phases of conflict situations. He believes, without being a Utopian, that men can slowly solve their problems.

The student can do the kinds of critical thinking required in this field. He can distinguish between relatively sound and unsound arguments and between logical and emotional support of a point of view. He can identify likenesses and differences between the views of political candidates and can estimate the relationship between the statements of political candidates, or others, and the actualities of the social world. He can compare present situations and probable results with similar situations observable in history. He can use the past as a partial guide to the possibilities of the future.

All of the areas of experience which were named earlier in this discussion were developed specifically in the fashion just illustrated. This first step is now being implemented by means of (1) faculty study of the analytical chart, with resulting changes and additions (2) classification of all courses and agencies in the Division in terms of their contributions to the specific *ends* and *intermediate ends* named in the chart (3) analysis of the actual programs of students who have graduated, with a view to discovering errors in order, in emphasis, or in content (4) intensive work by selected faculty members from all fields of learning, whose task it is to describe specifically the major contributions of these fields to the areas named in the

analytical chart, with careful definitions of the *levels* at which this learning applies. Obviously, the last step is a major intellectual project which will not be completed overnight but which, as it progresses, will influence directly both teaching and curricular planning.

The members of the Committee believe that *Column 2* in the chart, the column in which appear statements of the common goals sought by large numbers of individuals and groups, is pivotal. It places at the center of the educational plan the type of question which must come first in education for democracy:

(1) What are the common goals of individuals in a democratic society?
(2) What are the goals with which students enter college, the goals which really motivate their behavior?
(3) In what way can education prepare the student to choose and attain those goals which are desirable for him and for society?

Colleges of all kinds have been accused during the past two decades of pandering to the narrow interests of students whose only aim was to develop vocational or professional competence. The students have been blamed for their indifference to "higher" matters such as "culture" and "citizenship." This blame has often been applied by professors of these "higher matters" who have never troubled to define educational purpose in terms of the behavior of the educated and to relate their teaching directly to this behavior, who have even charged that such behavioral definition is too crassly utilitarian to have a place in "higher" education. In direct opposition to this view, the Committee would urge that the college which can *show* the student clear and specific relationships between his education and his possible life goals and between his individual goals and the kind of society which these goals will help to create will solve problems of motivation which have troubled general and liberal education for a long time. If human judgment, in the long run, is as sound as democracy assumes it to be, the college will not have to "tell" the student what goals to follow; the college will simply demonstrate to the limit of its ability the *results*, individual and social, which will arise from various possible courses of action and will trust the individual to make his own choices. The college will always have the obligation of showing the range of possible goals. But no college can give an education of this type until it has prepared itself to do so by means of a rigorous re-examination of all its purposes and methods.

As was suggested earlier, the implications of this work for administration are many. The administration must provide financial support for the necessary fact-finding and the necessary creative planning, without which creative teaching is impossible. The administration must encourage discussion of educational purposes and methods and be prepared to employ teachers who show promise of ability in the kind of functional teaching which will be needed. The administration must identify the groups and the individuals who will be responsible for decisions in respect to problems ranging from that of the relative emphasis to be placed on large educational purposes to that of how and when to achieve some highly specific aim. Since the implementation of any educational program depends finally upon the teacher, the administration must reward good teaching to the extent of its ability and create an atmosphere in which the able teacher will feel secure and in which his insights can be used. Finally, every individual in the college organization, whether his work be teaching or research or both, must see the place of his contribution in the total scheme and be assured of the value of that contribution.

AN ANALYTICAL FREQUENCY STUDY OF THE RECURRENT MENTION OF PERSONAGES WITHOUT MODIFICATION IN POPULAR PERIODICAL LITERATURE, 1922–1942

ROGER M. SHAW
Oberlin College

Editor's Note: Tradition has placed certain curricular values upon important personages. The author attempts to evaluate these persons objectively.

TRADITIONAL instruction in our elementary schools and in our high schools has treated or touched upon thousands of famous personages, but the determination of their relative educational importance has been left to tradition, authority, personal opinion, and modest objective research. It is hoped that this study may serve as an objective guide to the selection of personages for inclusion in the various areas of the school curriculum.

A utilitarian outlook prompted this investigation with this query: What eminent personages are encountered in the daily routine of the average literate adult? It is fairly reasonable to presume that this average adult's most frequent contact with famous personages will come through his reading and that his reading will be largely confined to periodicals. If this is true, an analysis of periodical literature may reveal the personages whom he will most frequently encounter. These personages are the ones with whom the schools might well make their students acquainted.

An effort has been made in this study to analyze a suitable sample of popular periodical literature for the purpose of learning which personages, on the basis of frequency of unmodified mention, are most often encountered and about whom the school might therefore logically teach.

THE READER'S DIGEST AS A CROSS SECTION OF POPULAR PERIODICAL LITERATURE

In a search for a suitable cross section of popular periodical literature, the *Reader's Digest* was found, after intensive examination, to be an almost made-to-order sample. It has the largest paid-circulation of all the magazines in the world, over 5,000,000 copies per month. The magazine was published 237 times in its first twenty years, and during that period, between February, 1922, and January, 1942, 7,448 major articles and 7,122 minor articles were digested from 583 magazines and 187 newspapers. Hundreds of thousands of articles were assayed by staff readers and then either rejected, or digested

and reprinted in the 25,498 pages of reading matter which are the *Reader's Digest* through January, 1942. Digesting, which is a process of reduction to approximately one-fourth the original size, is done largely by excision, and transitional rewriting is done in the author's own style so that the cutting is practically imperceptible.

SOME TERMS DEFINED

In the course of this report, extensive use will be made of six terms. For the sake of clarity they are here defined. The term *personage* means a person or character of rank or distinction; he may be historical, fictional or legendary. The terms *unmodified mention* and *allusion* are used interchangeably to indicate reference to a personage without any identifying explanation. The term *historic personage* is applied to personages whose lives were completed before 1890 as contrasted with *contemporary personages* who are those who have lived since 1890. A *key rank* is a permanent index number assigned to a personage on a basis of frequency of *unmodified mention* in the *Reader's Digest* between 1922 and 1942.

THE BASIC ANALYTICAL CRITERION

The basic criterion of selection in this study is *unmodified mention*. Note the following example of unmodified mention from the *Reader's Digest* of May, 1930:

> Yet the Bolsheviks, with all their desire for a nation of workers, offer, side by side with tremendous benefits, the methods of a Caesar, a Cromwell, a Franz Joseph, a Nicholas, and a Mussolini.

Or again, from the *Reader's Digest* of August, 1928:

> Shakespeare, Milton, Keats, Dickens, Hugo, Balzac, Whitman, Schiller, Beethoven, Handel, Gainsborough, Corot, Columbus, Lincoln, Booth, Patti, Jenny Lind, Edison, Pasteur, and a host of other remarkable persons somehow emerged from this stodgy Middle Class.

One can guess that these are famous folk, but, unless one recognizes their spheres of eminence, the reading is less than perfectly satisfactory.

In contrast, note the following example of *modified mention* from the *Reader's Digest* of January, 1942. References like this were not selected for

this study because the personage is explained, and for basic comprehension one needs no more information about the personage than is given in the statement itself:

"During the next five years," says Robert H. Hinckley, head of the Civil Aeronautics Administration, "we will develop at least half a million trained fliers—ready customers for air flivvers."

THE ANALYTICAL MATERIALS AND PROCESS

The source material for the analysis was every issue of the *Reader's Digest* from the first, which was published in February, 1922, through the two hundred and thirty-seventh, which came from the presses in January, 1942. Every page of every issue was analyzed except the occasional cover advertisements for the *Reader's Digest* itself. Altogether, an analysis of 25,498 pages was made.

The analytical process was primarily one of careful skimming during which every name which was unmodified was noted. A total of 34,296 notations was made.

THE FINDINGS

The findings of this analytical frequency study are primarily of a statistical nature and lend themselves to tabular presentation.

Table I presents, in order according to frequency of allusion, the 500 most frequently alluded-to personages and includes the statistical items by which their key ranks were determined. Precedent and reason prompted the use of the *number of periodical months* (number of months between 1922–1942 in the periodical literature of which allusion occurred) as the primary item for ranking.[1] Succeeding items were used to break ties. The *key rank* for each personage was determined by the order in which names were thus placed on this table.

REFINED LISTINGS OF PERSONAGES

The findings of this study, as presented in Table I, may be subjected to criticism from the standpoint of their usefulness to teachers and authors on the ground that they invite unwarranted comparisons between personages

[1] Cf. Bagley, W. C. *Fourteenth Yearbook, Part I*, p. 134. Also cf. Marston, L. R.; McKown, H. C.; and Bagley, W. C. *Seventeenth Yearbook, Part I*, p. 93. Also cf. Washburne, Carleton W. *Twenty-Second Yearbook, Part II*, p. 221. Above yearbooks are of the National Society for the Study of Education.

TABLE I

UNREFINED FREQUENCY LISTING OF THE 500 PERSONAGES MOST FREQUENTLY ALLUDED TO IN THE READER'S DIGEST BETWEEN 1922 AND 1942*

Key rank	Personage	Number of periodical months	Range of periodical years	Gross number of articles	Gross number of allusions	Number of periodical years
1	Jesus Christ	159	20	260	407	20
2	Lincoln, Abraham	139	20	223	287	20
3	Mussolini, Benito	116	19	179	225	19
4	Roosevelt, Theodore	115	20	163	199	20
5	Wilson, Woodrow	110	20	149	177	20
6	Napoleon I of France	108	20	156	184	20
7	Washington, George	108	20	143	169	20
8	Hoover, Herbert	107	20	152	188	20
9	Ford, Henry	101	20	150	192	20
10	Roosevelt, Franklin D.	98	18	219	281	14
11	Coolidge, Calvin	96	20	128	160	20
12	Shakespeare, William	94	20	120	135	20
13	Hitler, Adolf	93	12	292	520	12
14	Uncle Sam	91	20	116	152	20
15	Caesar, Julius	65	20	74	87	20
16	Lindbergh, Charles A.		46	Barnum, Phineas T.		
17	Franklin, Benjamin		47	Holmes, Oliver Wendell, Jr.		
18	Edison, Thomas Alva		48	Grant, Ulysses S.		
19	Emerson, Ralph Waldo		49	Elizabeth of England		
20	Jefferson, Thomas		50	Adam		
21	Shaw, George Bernard		51	Lee, Robert E.		
22	Clemens, S. L.(Mark Twain)		52	Beethoven, van, Ludwig		
23	Einstein, Albert		53	Kipling, Rudyard		
24	Stalin, Joseph		54	Taft, William Howard		
25	Lloyd George, David		55	Hamlet		
26	Darwin, Charles R.		56	Moses		
27	Harding, Warren G.		57	Disraeli, Benjamin		
28	William II of Germany		58	Clemenceau, Georges		
29	Thoreau, Henry David		59	Solomon		
30	Columbus, Christopher		60	Voltaire		
31	Plato		61	Chaplin, (C. S.) Charlie		
32	Edward VIII of England		62	Mellon, Andrew W.		
33	Smith, Alfred		63	Root, Elihu		
34	Victoria of England		64	Jackson, Andrew		
35	Lenin, Nikolay		65	Dante		
36	Rockefeller, John D., Sr.		66	Stevenson, Robert Louis		
37	Paul the Apostle		67	Gandhi, Mohandus K.		
38	Dickens, Charles		68	Pershing, John J.		
39	Morgan, John Pierpont, Jr.		69	Goering, Hermann		
40	Bryan, William Jennings		70	Johnson, Dr. Samuel		
41	Wells, Herbert George		71	Cleveland, Grover		
42	Hughes, Charles Evans		72	McKinley, William		
43	Churchill, Winston		73	Ruth, (G. H.) Babe		
44	Rogers, Will		74	Carnegie, Andrew		
45	Goethe, von, Johann W.		75	Socrates		

* Space restrictions require omission of ranking items beyond Julius Caesar and omission of personages with key ranks between 103 and 500. Complete data are available in an unpublished doctoral dissertation by same author and bearing same title. In library of Indiana University. 1942. 387 pp.

TABLE I (Continued)

Key rank	Personage	Key rank	Personage
76	Eve	91	George V of England
77	Lewis, Sinclair	92	Milton, John
78	Carlyle, Thomas	93	Hamilton, Alexander.
79	Webster, Daniel	94	Louis XIV of France
80	Confucius	95	Shylock
81	Byron, Lord	96	Newton, Sir Isaac
82	MacDonald, James Ramsay	97	Henry VIII of England
83	Homer	98	Young, Owen D.
84	Alexander the Great of Macedon	99	Byrd, Richard E.
85	Cromwell, Oliver	100	James, William
86	Beecher, Henry Ward	101	Aristotle
87	Tennyson, Alfred, Lord	102	Lewis, John L.
88	Rockefeller, John D., Jr.	103	Poe, Edgar Allan
89	Dempsey, (W. H.) Jack		
90	Santa Claus	500	George VI of England

of distinctly heterogeneous backgrounds. To meet such criticism, the personages involved in the study have been regrouped so as to present together for inspection those having a common environment either of historic background, or nationality, or activity.

Such listings do not represent in any way additional findings from this analytical frequency study. They are, rather, manipulations and refinements of these findings. Yet their presentation has been thought worth-while to make the findings of this study more immediately valuable to teachers whose interests involve special periods of history, special nationalities, or special fields of activity.

Within these added lists, the various personages are arranged in sequence according to the relative frequency of their unmodified mention in the *Reader's Digest* for the years 1922–1942. To avoid misinterpretation, however, of the sequence of placement of personages within these lists, it should be noted that this sequence does not, and can not, indicate the relative *importance* of personages in the various lists, but that this sequence does indicate the relative notoriety of such personages within the years 1922–1942, so far as such notoriety may be determined from their unmodified mention in the *Reader's Digest* for that period of years.

Table II, which follows, presents the 500 personages of this study in ten groups corresponding to the historic periods in which these personages lived or attained prominence.

TABLE II

THE 500 PERSONAGES ARRANGED ACCORDING TO FREQUENCY OF UNMODIFIED MENTION WITHIN TEN GROUPS CORRESPONDING TO HISTORIC PERIODS IN WHICH THESE PERSONAGES LIVED OR ATTAINED PROMINENCE#

Historic period	Serial number within group	Personage	Dates†	Key rank‡
ANCIENT TIMES To 500 A.D.	1	Jesus Christ	4 B.C.–29 A.D.	1
	2	Caesar, Julius	100– 44 B.C.	15
	3	Plato	427–347 B.C.	31
	4	Paul the Apostle	c. 3–66 A.D.	37
	5	Adam	c. 4004 B.C. (?)	50
	6	Moses	c. 1397–1277 B.C.	56
	7	Solomon, King of Israel	c. 1010– 932 B.C.	59
	8	Socrates	469– 399 B.C.	75
	9	Eve	c. 4004 B.C. (?)	76
	10	Confucius	551– 478 B.C.	80
	11	Homer	c. 900–800 B.C.(?)	83
	12	Alexander the Great	356–323 B.C.	84
	13	Aristotle	384–322 B.C.	101
	46	Euripides	480–406 B.C.	472
RENAISSANCE 1450–1625	1	Shakespeare, William	1564–1616	12
	2	Columbus, Christopher	c. 1446–1506	30
	3	Elizabeth of England	1553–1603	49
	4	Shylock	c. 1596	95
	5	Henry VIII of England	1491–1547	97
	6	Bacon, Sir Francis	1561–1626	134
	7	Michelangelo	1475–1564	139
	8	Galileo	1564–1642	155
	9	Luther, Martin	1483–1546	162
	10	Raleigh, Sir Walter	1552–1618	215.5
	11	Mary, Queen of Scots	1542–1587	273.5
	12.5	Magellan, Fernando	c. 1480–1521	284.5
	12.5	Smith, Captain John	1580–1631	284.5
	27	Essex, Earl of	1567–1601	495
EIGHTEENTH CENTURY 1700–1800	1	Washington, George	1732–1799	7
	2	Franklin, Benjamin	1706–1790	17
	3	Voltaire	1694–1778	60
	4	Johnson, Dr. Samuel	1709–1784	70
	5	Hamilton, Alexander	1757–1804	93
	6	Wesley, John	1703–1791	143
	7	Frederick the Great	1712–1786	168
	8	Rousseau, Jean Jacques	1712–1778	180
	9	John Bull	c. 1712	186
	10	Bach, Johann Sebastian	1685–1750	188
	11	Kant, Immanuel	1724–1804	195
	12	Louis XV of France	1710–1774	196
	13	Robinson Crusoe	c. 1719	197
	34	Chesterfield, Lord	1694–1773	476

Omission of whole historic periods and of personages within periods is required for brevity.

† The question mark (?) as used after dates assigned to personages in this table indicates that the historicity of such personages has been questioned by scholars. The letter c. prefixed to a date indicates that the date is an approximation.

‡ The key ranks establish the sequence of placement of the personages within the groups for the various historic periods. See above for the original derivation of these key ranks.

TABLE III

THE 500 PERSONAGES ARRANGED ACCORDING TO FREQUENCY OF UNMODIFIED MENTION WITHIN 39 GROUPS DESIGNATING THE NATIONALITY OF EACH PERSONAGE*

Nationality	Serial number within group	Personage	Place of birth	Key rank
AMERICAN	1	Lincoln, Abraham	Hodgenville, Kentucky	2
	2	Roosevelt, Theodore	New York, New York	4
	3	Wilson, Woodrow	Staunton, Virginia	5
	4	Washington, George	Westmoreland Co., Virginia	7
	5	Hoover, Herbert	West Branch, Iowa	8
	6	Ford, Henry	Greenfield, Michigan	9
	7	Roosevelt, Franklin D.	Hyde Park, New York	10
	8	Coolidge, Calvin	Plymouth, Vermont	11
	9	Lindbergh, Charles A.	Detroit, Michigan	16
	10	Franklin, Benjamin	Boston, Massachusetts	17
	11	Edison, Thomas Alva	Milan, Ohio	18
	12	Emerson, Ralph Waldo	Boston, Massachusetts	19
	13	Jefferson, Thomas	Shadwell, Virginia	20
	225. 5	Temple, Shirley	Santa Monica, California	498. 5
BRITISH	1	Shakespeare, William	Stratford-on-Avon	12
	2	Shaw, George Bernard	Dublin, Ireland	21
	3	Lloyd George, David	Manchester, Lancashire	25
	4	Darwin, Charles R.	Shrewsbury, Shropshire	26
	5	Edward VIII of England	Richmond Park, Surrey	32
	6	Victoria of England	Kensington Palace, London	34
	7	Dickens, Charles	Portsmouth, Hampshire	38
	8	Wells, Herbert George	Bromley, Kent	41
	9	Churchill, Winston	Blenheim Palace, Oxfordshire	43
	10	Elizabeth of England	Greenwich Palace, London	49
	11	Kipling, Rudyard	Bombay, India	53
	12	Disraeli, Benjamin	London	57
	13	Stevenson, Robert Louis	Edinburgh, Scotland	66
	105	George VI of England	York Cottage, Norfolk	500
FRENCH	1	Napoleon I of France	Ajaccio, Corsica	6
	2	Clemenceau, Georges	Mouilleron-en-Pareds, (La Vendee)	58
	3	Voltaire	Paris	60
	4	Louis XIV of France	St. Germain-en-Laye	94
	5	Curie, Marie	Warsaw, Poland, Russia	109
	6	Joan of Arc	Domremy-la-Pucelle	118
	7	Pasteur, Louis	Dôle (Jura)	133
	8	Balzac, de, Honoré	Tours, Touraine	164
	9	Rousseau, Jean Jacques	Paris	180
	10	Louis XV of France	Versailles, Isle-de-France	196
	11	Poincaré, Raymond	Bar-le-Duc, (Meuse)	204
	12	Foch, Ferdinand	Tarbes, (Haute-Pyrénées)	225
	13	Briand, Aristide	Nantes, (Loire-Inférieure)	242
	27	Zola, Émile	Paris	485. 5

* Omission of whole nationality groups and of personages within groups is required for brevity.

TABLE IV

THE 500 PERSONAGES ARRANGED ACCORDING TO FREQUENCY OF UNMODIFIED MENTION WITHIN 100 GROUPS DESIGNATING SPHERES OF ACTIVITY IN WHICH THESE PERSONAGES WERE RESPECTIVELY ENGAGED*

Group designating sphere of activity	Serial number within group	Personage	Identification	Key rank
GROUP 1 POETS	1	Shakespeare, William	Author, *Sonnets*, 1609	12
	2	Emerson, Ralph Waldo	Author, *Concord Hymn*, 1837	19
	3	Goethe, von, Johann W.	Author, *Hermann and Dorothea*, 1796-1797	45
	4	Kipling, Rudyard	Author, *Barrack Room Ballads*, 1892	53
	5	Voltaire	Author, *Poem on Disaster at Lisbon*, 1756	60
	45	Millay, Edna St. Vincent	Author, *The Buck in the Snow*, 1928	472
GROUP 38 INVENTORS	1	Franklin, Benjamin	Inventor, open-hearth stove, 1742	17
	2	Edison, Thomas Alva	Inventor, incandescent lamp, 1879	18
	3	Marconi, Guglielmo	Inventor, wireless telegraphy, 1899	217
	4	Vinci, da, Leonardo	Inventor, excavation machinery for Martesana Canal, Milan, Italy, c. 1483-1499	303
	5	Watt, James	Inventor, practical steam engine, 1769	310
	6	Fulton, Robert	Inventor, practical steamboat, 1807	316
	7	Wright, Orville	Co-inventor, practical airplane, 1903	436.5
GROUP 46 QUEENS	1	Victoria of England	Queen of England, 1837-1901	34
	2	Elizabeth of England	Queen of England, 1558-1603	49
	3	Cleopatra of Egypt	Queen of Egypt, 51-30 B.C.	112
	4	Helen of Troy	Queen of Sparta (?), c. 1200 B.C.	116
	5	Mary, Queen of Scots	Queen of Scotland, 1543-1567	273.5
	6	Marie Antoinette of France	Queen-consort of Louis XVI of France, 1774-1793	349
	7	Isabella of Castile	Queen of Castile, 1474-1504	376
	8	Mary (Windsor) of England	Queen-consort of George V of England, 1910-1936	481
GROUP 72 MILITARY COMMANDERS	1	Roosevelt, Theodore	American commander, Spanish-American War, 1898	4
	2	Napoleon I of France	French conqueror, Napoleonic Wars, 1797-1815	6
	3	Washington, George	American commander, American Revolution, 1775-1783	7
	4	Caesar, Julius	Roman commander, Gallic Wars, Roman Civil War, 58-47 B.C.	15
	5	Grant, Ulysses S.	Union commander, American Civil War, 1861-1865	48
	40	Genghis, Khan	Mongol conqueror, Mongol Empire, 1211-1223	497

* Omission of whole activity groups and of personages within groups is required for brevity.

TABLE IV (Continued)

Group designating sphere of activity	Serial number within group	Personage	Identification	Key rank
GROUP 92 SPORTSMEN AND SPORTS PROMOTERS	1	Ruth, (G. H.) Babe	American baseball home run record holder, 1919, 1921, 1927	73
	2	Dempsey, (W. H.) Jack	World's heavy-weight boxing champion, 1919-1926	89
	3	Tunney, (J. J.) Gene	World's heavy-weight boxing champion, 1926-1928	120
	4	Tilden, (W. T.) Bill	World's amateur tennis champion, 1920-1925	321
	5	Rickard, (G. L.) Tex	American prize-fight promoter 1910-1929	386
	6	Rockne, Knute	Football coach, Notre Dame, 1918-1931	479
	7	Jones, (R. T.) Bobby	National open golf champion, United States and Great Britain, 1926, 1930	483. 5

A second so-called refinement of the basic findings of this study is found in Table III. This table presents the 500 personages of the study in 59 groups corresponding to the nationalities of the various personages.

The third and final refinement of the basic findings of this study is a listing of the 500 personages of the study according to their various spheres of activity. This listing is found in Table IV and involves the grouping of personages under 100 different classifications representing the various spheres of activity in which they as individuals have won prominence.

COMPARISON WITH WASHBURNE'S WORK

Shortly after this study was conceived, the author discovered that Carleton W. Washburne, Superintendent of the Winnetka Public Schools, had conducted an elaborate frequency analysis of periodical literature some twenty years earlier.[2] Upon minute examination of his research report, it was apparent that, although his analysis was not focused entirely on the personage field, its purpose, procedure, and findings were sufficiently similar to permit comparison with the present study. From the beginning, therefore, the current study was prosecuted with the intent that one of its major functions might be the supplementation of Dr. Washburne's work. Two studies of this

[2] Washburne, Carleton W. "Basic Facts Needed in History and Geography: A Statistical Investigation." *Twenty-Second Yearbook, Part II*, National Society for the Study of Education, pp. 216–33.

type, based cumulatively on thirty-seven years of periodical literature, 1905-1942, might provide very significant curricular data.

The fundamental findings of the two studies are two lists of personages, ranked in order of frequency of allusion and derived by similar processes. Washburne's list included 519 persons, whereas the present list involves 500. For purposes of casual comparison the first fifteen persons in each list will probably suffice. They are here presented in Table V.

TABLE V

THE FIRST 15 PERSONAGES IN THE WASHBURNE AND SHAW LISTS

Shaw list		Washburne list	
Personage	Key rank	Personage	Key rank
Jesus Christ	1	Roosevelt, Theodore	1
Lincoln, Abraham	2	Lincoln, Abraham	2
Mussolini, Benito	3	Wilson, Woodrow	3
Roosevelt, Theodore	4	Taft, William Howard	4
Wilson, Woodrow	5	Washington, George	5
Napoleon I	6	Kipling, Rudyard	6
Washington, George	7	Jesus Christ	7
Hoover, Herbert	8	Napoleon I	8
Ford, Henry	9	Bryan, William Jennings	9
Roosevelt, Franklin D.	10	Shakespeare, William	10
Coolidge, Calvin	11	Lloyd George, David	11
Shakespeare, William	12	William II, Kaiser	12
Hitler, Adolf	13	Shaw, George Bernard	13
Uncle Sam	14	Caesar, Julius	14
Caesar, Julius	15	Hughes, Charles Evans	15

Casual inspection may reveal the following interesting situation. If the contemporary personages are removed from among the first 15 personages in each list, the result is that the same six personages are left as the first six most-frequently-alluded-to historic personages in both lists. These men are *Christ, Lincoln, Napoleon, Washington, Shakespeare,* and *Caesar.* Are these, perchance, the six men who are most universally recognized by Americans? Table VI, which follows, presents this phenomenon.

Casual inspection, however, cannot be regarded as a comprehensive comparison of the two lists as whole lists. For such a comparison, a statistical correlation seems most suitable. The basic data, being founded upon rank frequency, are suitable for correlation by the method of rank differences, otherwise known as the *Spearman Rho.* This formula, $\rho = 1 - \frac{6\Sigma D^2}{N(N^2-1)}$,

was applied to the ranks of the personages common to both lists. This resulted in a rho of .57 ± .03. This coefficient of rank order correlation indicates a positive and significant relationship between the findings of the two studies. This means that *in general* the personages who hold low key ranks in this study also held low key ranks in the earlier study. Likewise those who are found far down the list in this study are similarly placed in Washburne's work.

TABLE VI

THE FIRST 15 PERSONAGES IN THE WASHBURNE AND SHAW LISTS WITH THE CONTEMPORARY PERSONAGES DELETED

Shaw list		Washburne list	
Personage	Key rank	Personage	Key rank
Jesus Christ	1		
Lincoln, Abraham	2	Lincoln, Abraham	2
		Washington, George	5
Napoleon I	6		
Washington, George	7	Jesus Christ	7
		Napoleon I	8
		Shakespeare, William	10
Shakespeare, William	12		
		Caesar, Julius	14
Caesar, Julius	15		

From the beginning it was felt that the inclusion in these correlations of every person common to both lists, whether he be contemporary or historic, was bound to make the relationship less striking. With this in mind, another rank difference correlation was run on the so-called *historic personages* common to both lists. An arbitrary division point between *contemporary* and *historic* personages was selected. After much deliberation the year 1890 was decided upon, and all personages who were alive in 1890 or thereafter were called contemporary. All personages whose lives were completed before 1890 were called historic. All characters of fiction and legendary characters were omitted from this manipulation.

To the ranks of these personages the formula for correlation according to rank differences was again applied, and the resultant rho was .67 ± .03. This rho is .10 higher than that obtained for the correlation of the ranks

of the historic *and* contemporary personages who were common to both lists. There is, therefore, some reason to believe that the *historic personages* are somewhat more accurately ranked by this type of research than are the *contemporary personages*.

CONCLUSIONS

The problem of this study was to answer this question: Who are the personages to whom allusion without any identifying explanation is most frequently made in popular periodical literature? Insofar as the *Reader's Digest* during the first twenty years of its existence is an adequate sampling of popular periodical literature, the answer is revealed in Table I, the major finding of this study. In addition, perhaps the following concluding statements are justified:

1. These are the 500 personages who must be recognized most frequently by the reader of popular periodical literature because they are the personages who are most frequently alluded to without explanation in that literature.

2. They are the personages whom the authors, editors, and reading public expect the reader to recognize; the reader must know something about them if his reading is to be most meaningful.

3. This list of 500 personages is submitted as a guiding bit of evidence as to the personages to whom the schools might well give some attention in their various grades, in their various subject-matter fields, and in their various curricula.

Caution must be urged against regarding these 500 as the *greatest* personages of all time. The study does not measure *greatness* but indicates the personages who must be instantly *recognized* by the reader of popular periodical literature. Judged on the basis of life-long utility for the student, perhaps the acquisition of knowledge about the personages who find high places on this list might well be emphasized in preference to learning about less universally-known personages who are not found herein.

THE RELATIVE EFFECTS OF DISTINCT AND INDISTINCT ENUNCIATION ON AUDIENCES' COMPREHENSION OF PROSE AND POETRY[1]

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Editor's Note: Skill in speech has been found to be a factor in teaching efficiency. The author of the study here reported finds that enunciation is an important factor in the comprehension of prose and poetry.

THE purpose of the investigation was to measure the relative effects of distinct and indistinct enunciation on audiences' comprehension of spoken descriptive prose and lyric poetry in order to evaluate these speech types as factors of communication. Any obtained difference between the effects of these two variables was believed to constitute a valid index of the power of the one to decrease comprehension in terms of the other.

The significance of the research may be found in the social, cultural, and psychological importance of language[2] generally, and speech particularly, in view of its high degree of specialization,[3] the need for scientific psychological evaluations of speech techniques, and in consideration of the highly complex nature of the mental aspects of speaking and the symbolic functions of words in listeners' minds.

Inasmuch as varied opinions concerning the functions of words and language techniques exist, it may be well to recognize that (1) visual and auditory presentations differ in their effects on the mind,[4] and that (2) the physical form (e.g. quality) of a spoken word may be a vital component of that part of the word which determines meaning in the mind of the hearer.

PROCEDURE

The experiment was conducted in Julia Richman High School, a four-year high school in New York City. Two similar groups of sophomore girls,

[1] Portion of an investigation conducted under the auspices of the School of Education, New York University.

[2] See Dewey, John. "Democracy and Education," (New York: The Macmillan Company, 1916), p. 272.

[3] de Laguna, Grace. "Speech: Its Function and Development," (New Haven: Yale University Press, 1927), p. 20.

[4] Cantril and Allport. "The Psychology of Radio," (New York: Harper and Brothers, 1935), Chapter IX.

totaling 226 subjects, were used in connection with the rotation of literary specimens and speech styles during the rotation-group procedure. These groups approximated each other in the respects of: grade level, sex, English grades, intelligence (I.Q.), and auditory acuity. The first and the second bases of similarity were equal in both groups; the average English grades were 78 and 75 per cent, with similar ranges; the mean intelligence (I.Q.) scores were 105.5 and 105.1, with standard deviations of 11.9 and 10.3; and the subjects' hearing acuity was normal.

Four specimens of prose and four specimens of poetry served as literary materials. They were selected and arranged in pairs on the bases of criteria which made the two members of each pair equivalent for experimental purposes, namely, suitability of content, similarity in literary style, suitability of comprehension for the grade level, length of the specimens, literary value, and relative unfamiliarity to the subjects. Separate test forms were designed for prose and poetry and an individual test was constructed for each specimen. The score range extended from 0 to 50 points.

In order to insure that non-experiment factors could be held constant during all the presentations and that the speech styles would be, in all cases, true types of speech, the investigator recorded all specimens of prose and poetry in both the distinct and the indistinct styles on acetate records. The frequency range of the recording and playback machines extended from 50 to 8,000 d.v. per second. The adequacy of such a range for high-fidelity speech reproduction has been discussed by Fletcher,[5] and was further corroborated by experts at the Graybar Electric Company, New York City.

The modified rotational sequence was the same for prose and poetry. It involved the assignment of letter names, A–B and C–D, to the two pairs of specimens in each literary type, and the use of specimen "sets," which were specimen pairs in either a distinct–indistinct or an indistinct–distinct style sequence. Thus, Group I heard Specimen A–distinct and Specimen B–indistinct, and Group II heard Specimen A–indistinct and Specimen B–distinct. The style order for the pair C–D was the reverse of that used for A–B. The administration of each test occurred immediately after the presentation of its related specimen.

[5] Fletcher, Harvey. "Speech and Hearing," (New York: D. Van Nostrand Company, Inc., 1929), p. 62.

RESULTS

The first step in the treatment of the data was the determination of the mean comprehension scores achieved by the two groups in each of the style categories of both literary types. The score averages and the per cents of loss of comprehension caused by the depressing influence of indistinct enunciation follow.

THE MEAN COMPREHENSION SCORES AND THE PER CENTS OF LOSS OF COMPREHENSION OF PROSE AND POETRY FOR GROUP I AND GROUP II

	Enunciation					
	Group I			Group II		
	Distinct	Indistinct	% Loss	Distinct	Indistinct	% Loss
Prose	25.9	12.5	51.7	29.7	11.8	60.3
Poetry	27.3	18.1	33.7	29.4	15.7	46.6

The data reveal that indistinct enunciation caused a marked decrease in the comprehension of prose and poetry in both groups of subjects. In terms of per cents, these reductions of comprehension were: 51.7 for Group I and 60.3 for Group II for prose, and 33.7 and 46.6 for poetry. It may be noted that prose was apparently affected adversely more than poetry. Although the tests were not the same in all respects, it is believed that they were sufficiently similar to justify a comparison of the results. In this regard, it is suggested that perhaps the disparities in the scores of the literary categories might have resulted from some inherent difference in the natures of prose and poetry.

Perhaps a clearer picture of the effects of the variable may be seen in the mean scores and the per cents of loss of comprehension as computed for the total number of subjects. These effects are shown in the following table.

	Enunciation		
	Distinct	Indistinct	% Loss of Comprehension
Prose	28.16	12.09	57.1
Poetry	28.60	16.70	41.6

On the basis of these data, it may be stated that audiences' comprehension of descriptive prose indistinctly enunciated is only *42.9 per cent* of the amount of comprehension when the same prose is heard with distinct enunciation, and that audiences' comprehension of poetry indistinctly enunciated is only *58.4 per cent* of their comprehension of distinctly-enunciated poetry.

Information concerning the distribution of the scores and the reliability of the data may be of interest.

THE MEANS, THE STANDARD DEVIATIONS, THE STANDARD ERRORS OF THE MEANS, THE DIFFERENCES, THE STANDARD ERRORS OF THE DIFFERENCES, AND THE CRITICAL RATIOS FOR DISTINCT AND INDISTINCT ENUNCIATION OF DESCRIPTIVE PROSE AND LYRIC POETRY

	Enunciation			
	Prose		Poetry	
	Distinct	Indistinct	Distinct	Indistinct
M	28.16	12.09	28.60	16.70
σ	8.37	10.60	8.36	10.09
σ_m	.409	.514	.408	.495
D	16.07	...	11.90	...
σ_d	.66	...	.64	...
CR	24.35		18.60	

The standard deviations indicate that indistinct enunciation tended to depress the entire distributions of the scores rather that create distortions in the patterns of the distributions. The standard deviations for distinct enunciation are markedly similar for prose and poetry (8.37 and 8.36), and the standard deviations for indistinct enunciation are likewise similar (10.60 and 10.09).

The most significant features, however, are the high critical ratios of 24.35 for prose and 18.60 for poetry. Since a critical ratio of 3.0,[6] or higher, represents almost total reliability, it is evident that the CR's of the present data signify a reliability that is practically complete.

As an additional check on the significance of the difference between the scores in the two variable categories, bi-serial r coefficients were com-

[6] Garrett, Henry. "Statistics in Psychology and Education," (New York: Longmans, Green and Company, 1930), p. 133.

puted. These coefficients were .90 for prose and .77 for poetry. They show a wide divergence of scores resulting from the operation of the indistinct variable.

SUMMARY

1. Indistinct enunciation decreased audiences' comprehension of spoken prose 57.1 per cent, and audiences' comprehension of spoken poetry 41.6 per cent, in comparison with their comprehension of the literature when it was presented with distinct enunciation.

2. Indistinct enunciation affected the comprehension of the entire audiences, rather than limited areas within the audiences.

3. The reliability of the data was very high.

4. The divergence of the scores between the distinct and the indistinct categories was wide and statistically significant.

DISCUSSION

The extent to which the results of this experiment may apply to the oral communication of other types of prose (e.g. "factual" materials) is not known; however, since this study treated both prose and poetry, it is conceivable that the effects of indistinct enunciation on other types of prose may not be dissimilar to the effects herein described.

HOME BACKGROUND OF HIGH-SCHOOL YOUTH

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Editor's Note: Many persons have noted the changing character of the high school population. The author reports in this article the social and economic aspects of home background.

THIS article is part of a study concerning social backgrounds and interests of high-school youth. By questionnaire, data for the entire study were secured from 8–12 high schools, each of 150–500 pupils, in each of 9 states.[1] The number of pupils who participated in the study ranged from 1,644 to 2,007 in the different states. This particular article deals with those social and economic aspects of the home background of high-school youth which relate to size and type of household, size of family and ages of other children relative to the age of the pupil reporting, marital status of siblings older than the pupil reporting, and family unity as measured by the extent to which unmarried siblings sleep and eat the evening meal in the parental home.

Size and type of household.—Data appear in Table I indicating the number of rooms of all types in the home, the number of bedrooms, and whether or not the home has a "sitting room."

A smaller percentage of seniors than of freshmen live in homes of four or fewer rooms. No difference appears between the two school grades in percentage of youth who represent homes of five or six rooms, but a larger percentage of seniors than of freshmen come from homes of seven or more rooms. A similar situation prevails in regard to the number of bedrooms in the home. Thus a smaller percentage of seniors than of freshmen come from homes which have only one or two bedrooms, whereas a larger percentage of seniors come from homes which have three or more bedrooms. A substantially larger percentage of seniors than of freshmen report a sitting room in the home.

The foregoing differences between the two grade levels seem at least in part to reflect economic selection among pupils during the high-school period. Families that can most easily bear the cost of food, clothing, books, medical care, etc., for youth during a period of high-school education, seem also to be the ones who can best afford to live in houses with several rooms, including sitting rooms and various bedrooms.

[1] California, Georgia, Illinois, Louisiana, North Carolina, Oklahoma, Pennsylvania, Washington and Wyoming.

TABLE I

SIZE OF HOUSE IN WHICH HIGH-SCHOOL YOUTH LIVE ACCORDING TO NUMBER AND TYPE OF ROOMS AND ACCORDING TO GRADE AND SEX OF YOUTH

Grade and Sex of Pupil	Number and Type of Rooms												
	Rooms of All Kinds						Bed Rooms					Sitting Room	
	No. of Pupils Reporting	Pct. Distribution by No. of Rooms					No. of Pupils Reporting	Pct. Distribution by No. of Bed Rooms				No. of Pupils Reporting	Pct. Having Sitting Room
		Two or fewer	Three	Four	Five or Six	Seven or More		One	Two	Three	Four or More		
Freshmen:													
Boys	1,958	2.1	5.1	14.1	39.3	39.4	1,977	6.1	35.4	36.5	22.0	1,962	75.1
Girls	2,129	1.7	4.8	13.4	40.8	39.3	2,138	5.5	35.1	38.2	21.2	2,138	76.6
Seniors:													
Boys	1,668	0.6	2.7	8.5	38.2	50.0	1,678	3.5	26.5	41.6	28.4	1,674	82.9
Girls	1,893	0.4	2.8	9.0	41.3	46.5	1,908	3.1	27.3	43.0	26.6	1,915	82.8

It is of course probable that freshmen on the whole represent younger families than do seniors. Hence it might be thought that the families represented by freshmen have followed somewhat more the modern trend toward smaller homes or apartment-house dwelling. In such smaller homes or apartments one would less commonly find a sitting room or a spare bedroom, than in some of the earlier and more spacious if less comfortable houses. It is conceivable that socially immature freshmen are less familiar than seniors with the concept "sitting room," and hence are less likely to consider a particular room to be a sitting room. One could also suggest that the economic middle class, represented somewhat more strongly among seniors than among freshmen, is more conservative than other economic groups concerning household design and architecture, and hence would be more likely to include in the home one or more spare rooms intended for occasional use.

Of the different explanatory possibilities suggested for the larger number of rooms, including bedrooms and sitting rooms, in the homes of seniors than of freshmen, it seems that the most significant factor is the economic one—seniors to a greater extent than freshmen come from families that can afford to live in houses which have several rooms.

Size of family and sibling position of youth reporting.—Table II presents data on the size-of-family of high-school youth, and on the birth sequence or sibling position among his brothers and sisters of the youth who reported in the study.

Seniors of both sexes report the absence of older siblings of either sex to a somewhat greater extent than do freshmen; that is, in the composition of American families as here reflected, a senior of either sex is somewhat more likely to be the oldest member of his family than is a freshman. On the other hand the percentage of seniors who have no siblings younger than themselves seems about the same as the corresponding percentage of freshmen; that is, a senior is as likely as a freshman to be the youngest member of his family. If seniors are more likely than freshmen to be the oldest in the family, and as likely to be the youngest, it follows that seniors represent smaller families than do freshmen. This observation concerning relative family size of freshmen and seniors, is in harmony with the economic interpretation offered in regard to size of household represented by pupils at the two grade levels.

TABLE II

SIZE OF FAMILY AND SIBLING POSITION OF HIGH-SCHOOL YOUTH, ACCORDING TO GRADE AND SEX OF PUPIL

Grade and Sex of Pupil	Size of Family and Sibling Position of Pupil Reporting														
	Brothers							Sisters							
	Older				Younger				Older				Younger		
	No. of Pupils Reporting	Pct. Distribution by No. of Older Bros.			No. of Pupils Reporting	Pct. Distribution by No. of Younger Bros.			No. of Pupils Reporting	Pct. Distribution by No. of Older Sisters			No. of Pupils Reporting	Pct. Distribution by No. of Younger Sists.	
		None	One or two	Three or more		None	One or two	Three or more		None	One or two	Three or more		None	One or two	Three or more
Freshmen:															
Boys	1,908	45.9	43.3	10.8	1,877	49.6	43.7	6.7	1,843	46.2	42.9	10.9	1,845	50.5	42.1	7.4
Girls	2,054	44.7	42.6	12.9	2,038	48.8	43.0	8.2	2,057	44.4	42.5	13.1	2,023	48.5	43.9	7.6
Seniors:																
Boys	1,605	49.3	39.5	11.2	1,569	49.7	41.9	8.4	1,568	48.1	40.3	11.6	1,559	50.8	43.1	6.0
Girls	1,852	46.6	42.4	11.0	1,830	47.9	43.7	8.4	1,808	49.1	39.8	11.1	1,803	49.7	42.4	7.9

In comparing the two sexes, it appears that among freshmen girl-pupils in general represent homes in which there are somewhat more children than there are in the homes represented by boy-pupils. This point is most clearly shown by the four categories which indicate the entire absence of either older or younger siblings of either sex, and by the categories relating to "Three or More" brothers or sisters either older or younger than the pupil reporting. If girls come from larger families, it seems that in families which have limited home resources the girls are accorded some educational advantage over the boys. To some extent other studies have suggested a similar relationship between the sexes. By way of explanation of this sex difference one might suggest that the high-school curriculum does not appeal as much to boys as to girls, and accordingly that boys are not as extensively represented among high-school pupils. Pursuing this logic it might be added, in regard to boys from families of different sizes, that a somewhat conventional or classical curriculum has more appeal for boys of small families than for boys of large families. The reasoning of the last two sentences might in some degree appear logical, yet in the absence of further data it seems quite speculative. Moreover it should be noted that the consistent sex difference observed among freshmen, does not appear among seniors.

Marital status of siblings of high-school youth.—It might be thought that the sex of older children in the home, would affect the sex of those younger children who remain in high school. Thus one might think that a girl who enters high school would more likely be able to complete the course if she has older sisters at home who could render needed female help in the home, than would be the case if the girl was the oldest daughter in a family of several children. Obviously a similar relationship might be thought to exist between a boy entering high school and older brothers in the home, particularly in the case of semi-rural high schools where a large proportion of the children live on farms and where boys at an early age begin to participate in the farm enterprise. If this relationship for pupils of either sex did really exist, however, one would expect that the girls actually in high school would have a lower percentage of married sisters—of sisters who have gone out of the home and who consequently render no domestic service there, than would be the case among high-school boys. By parallel reasoning the boys actually in high school might be expected to have a smaller percentage of married brothers than have the girls in high school. Data on this and related items appear in Table III.

TABLE III

MARITAL STATUS OF OLDER SIBLINGS OF HIGH-SCHOOL YOUTH

Grade and Sex of Pupil	Brothers				Sisters			
	No. of Pupils Reporting	Pct. Distribution by No. of Married Brothers*			No. of Pupils Reporting	Pct. Distribution by No. of Married Sisters*		
		None	One or Two	Three or More		None	One or Two	Three or More
Freshmen:								
Boys	1,764	61.8	33.8	4.4	1,767	43.4	46.4	10.2
Girls	1,940	58.0	36.0	6.0	1,973	38.4	50.8	10.8
Seniors:								
Boys	1,525	49.4	42.8	7.8	1,529	27.6	59.0	13.4
Girls	1,758	50.0	44.2	5.8	1,774	31.6	57.2	11.2

* It was assumed that in an average family roughly half the siblings would be younger and half older than the youth reporting. The younger half were not considered marriageable; hence the data presented relate to the older half.

The footnote to Table III should be observed, when interpreting the data presented. The data do not substantiate the reasoning of the foregoing paragraph. So far as these data are concerned, there seems to be no connection between the sex of older married siblings in the family and the particular sex of younger members of the family who are likely to remain in high school.

The fact that the pupils reporting, both sexes and both grades, indicate a larger percentage of married sisters than of married brothers, seems merely a reflection of the fact that in our society girls get married younger than boys.

Do unmarried siblings eat and sleep at home.—To some extent family unity can be judged by the extent to which all unmarried children sleep and eat the evening meal in the parental home. The data of Table IV bear on this point.

The table considers only siblings who are older than the youth reporting. A slightly larger percentage of the older unmarried siblings sleep at home, than eat the evening meal at home. Seniors report a somewhat smaller percentage of older siblings who eat and sleep at home than do freshmen, which is perhaps to be expected in view of a somewhat more advanced average age of siblings in families from which seniors come. The fact that the difference between freshmen and seniors is as small as the table shows, however, suggests that there are probably a few years beyond the high-school age during which youth if employed at all are likely to be employed in the home community.

TABLE IV

EXTENT TO WHICH OLDER UNMARRIED SIBLINGS OF HIGH-SCHOOL YOUTH EAT AND SLEEP AT HOME

Grade and Sex of Pupil	Eating and Sleeping at Home			
	Do ALL Unmarried Siblings Eat Supper at Home		Do ALL Unmarried Siblings Sleep at Home	
	No. of Pupils Reporting	Pct. who answered "yes"*	No. of Pupils Reporting	Pct. who answered "yes"*
Freshmen:				
Boys	1,741	23.3	1,777	24.7
Girls	1,932	23.3	1,938	25.4
Seniors:				
Boys	1,448	20.2	1,484	22.3
Girls	1,690	21.1	1,716	23.2

* As in the case of Table iii, it was here assumed that half of the siblings would be older and half younger than the youth reporting. The data presented relate to the older half of the sibling group.

The table shows that roughly from twenty to twenty-five percent of the older unmarried siblings eat and sleep at the parental home. Whether this seems a large or a small percentage will depend somewhat on the viewpoint of the reader. It should be noted, however, that the pupils reporting are pupils who report that *all* of their older unmarried siblings eat and sleep at the parental home, not that a part of them do so. Among factors which bear on the percentage who eat and sleep at the parental home are the percentage of older siblings who have left the parental community to attend college, the extent of general unemployment of youth who have quit or have finished high school, and the employment possibilities of the home community as compared with other communities which are beyond commuting distance from the home. Obviously military and other defense activity during the current emergency bears on the foregoing items.

Summary.—The following summary statements seem justified.

1. Seniors in general live in homes which have more rooms, including more bedrooms and more sitting rooms, than have the homes in which freshmen live.

2. Seniors on the whole come from somewhat smaller families than do freshmen.

3. Among freshmen there is evidence that girls come from somewhat larger families than boys come from, but this sex difference does not appear among seniors.

4. The data here presented do not substantiate the thought that the sex of older unmarried children in the home, affects the sex of those younger children from the family who are likely to continue through high school.

5. High-school youth of both sexes and both grades report a larger percentage of married sisters than of married brothers.

6. Roughly from twenty to twenty-five percent of the older unmarried siblings sleep and eat the evening meal in the parental home. A slightly higher percentage sleep at home than eat there, and freshmen report a somewhat higher percentage of unmarried older siblings who eat and sleep at home than are reported by seniors.

A DIAGNOSTIC STUDY OF SPELLING READINESS

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Editor's Note: The importance of "readiness" testing in reading and arithmetic seems to have been accepted by educational workers. The author presents data of spelling readiness.

I. THE PROBLEM

EDUCATORS today agree that a child should have a social, emotional and physical "readiness" for school when he enters the first grade as well as interests, skills, and a mental "readiness" for the more academic pursuits of school at whatever level he begins to engage in them. Some successful efforts have been made in measuring and establishing "readiness" for reading, arithmetic, and one or two other academic activities; the present study is an attempt to discover some factors associated with "readiness" for spelling, or ability to learn English spelling in the primary grades. It explores the relation of spelling ability to other language skills in the high first and low second grades and studies some effects on early spelling ability of two types of reading programs, one involving early and large amounts of phonetic analysis, the other later and less emphasis on phonetic procedures.

II. PROCEDURES

This investigation involves four classes and 116 pupils of the greater Vancouver, British Columbia, area who were studied in the first grade in May and June of 1941, and in the second grade in November of 1941. Each pupil's abilities were measured by six group tests and seven individual tests. The group tests used were: (1) a group intelligence test—the Detroit First Grade or the Pintner–Cunningham Primary Mental Test. (2) An informal spelling test of twelve words (given in June). (3) The dictation test of the New Stanford Achievement Test: Primary Examination (given in November). (4) Gates Primary Reading Test, Type I, Word Recognition. (5) Gates Primary Test, Type III, Paragraph Reading. (6) A mimeographed visual perception test of like and unlike word-pairs (which had a split-halves reliability stepped up by the Spearman–Brown formula of 0.89). The

* This study was aided by a grant from the Canadian Council for Educational Research.

individual tests taken from the Gates Reading Diagnosis Tests[1] were: (7) Word Recognition Test—Visual Presentation (VIII 2), (8) Naming Capital Letters (IX 10), (9) Naming Lower Case Letters (IX 11), (10) Giving letters corresponding to letter sounds (X 2), (11) Giving words ending with a stated sound (Rhyming Words) (X 4), (12) Spelling Nonsense Syllables (B_2),[2] and (13) Visual Perception (B_2)[3]. In summary, each pupil was given one group intelligence test, two spelling tests, four reading and letter recognition tests, three visual perception tests and three auditory perception tests.

The four classes used in the study came from "average" districts as determined by the opinion of school officials. They were selected on the basis that two of the teachers used much phonics and two used little phonics in their primary reading programs. The original division on the basis of method of instruction was made by the Primary Supervisor of the Vancouver Schools and verified further by classroom visits and interviews with the teachers. In regard to their methods the two teachers who stressed the use of phonetic methods with their pupils (hereinafter called the "phonics group") said that "phonics should be so integrated with reading activities that they are in perpetual use" and "the very first week some child remarks on words beginning with the same sound; right then attention is directed to the similarity of sound. After that, day by day a new sound is found, always related to their reading work." The two teachers who did little work in phonics with their pupils (hereinafter called the "little-phonics group") put more stress on an informal reading readiness program in the early months, and suggested that they started a little work in phonics "often in January" and "when the children read little library books independently." The two groups also differed in their approach to hand writing. Both teachers of the phonics group said that they began some handwriting "the first week of school" while the teachers of the "little-emphasis" group made it much more incidental in their programs. None of the pupils had formal spelling lessons in the first grade, but all had them in the second grade. In promoting pupils to the second grade in June, none of the teachers

[1] These tests are explained in Gates, A. I., *The Improvement of Reading*, New York, The Macmillan Co., 1935 edition, pp. 544 to 560. The test booklets are published by Bureau of Publications, Teachers College, Columbia University.

[2] Described in the 1927 edition of *The Improvement of Reading*, p. 386.

[3] Described in the 1927 edition of *The Improvement of Reading*, p. 397.

took spelling ability into account, but the two teachers of the phonics group used phonetic ability "as it affects reading attack" as one criterion of promotion. In general, then, the "much emphasis group" had early and rather direct instruction in reading, phonetic analysis and handwriting, while the "little-emphasis group" had somewhat later and less direct practice in these language skills. The average I.Q. of the phonics group was 104 and of the little-phonics group was 105. The four teachers concerned were not rated formally but all are considered in their school systems as being above average or superior in teaching ability.

III. RESULTS AND IMPLICATIONS

The results shown in Table I reveal consistent and, in all but one instance, reliable differences favoring the "much emphasis group" in the spelling, reading, visual perception and auditory perception tests given in the study. The only differences not reliable are those in mental age, on which the groups were matched, and in (12) the rhyming test, which seems unimportant since pupils in each group scored, on the average, only 3 (out of a possible 9). The table reveals clearly that the early and rather direct type of instruction in the phonics group has a favorable influence on achievement in spelling, reading, as measured by the Gates primary tests, and some related visual and auditory abilities as here measured. This influence persists at least into the following semester in the case of spelling as measured by the New Stanford dictation test. The results support the findings of Agnew[4] and others that considerable phonics instruction in the first grade has a favorable influence upon achievement in word recognition and accuracy in reading. They indicate that some of the habits of attention to parts of word, of seeing similarities and differences in words, and of recognizing common phonograms in words, or other habits developed in phonetic analysis, apparently are of value in early attempts at spelling English words. The results do not establish, however, a clear pattern of cause and effect relationships between phonetic instruction and successful visual and auditory perception. It is important to note that the teachers of the "phonics group" used more than a phonetic method with an exclusive reliance on the sounds of words. Accordingly, it is not possible to say definitely that work in phonics improves

[4] Agnew, D. C., *The Effect of Varied Amounts of Phonetic Trainings on Primary Reading*, Durham, N. C., Duke University Press, 1938.

TABLE I

VERBAL, VISUAL AND AUDITORY ABILITIES OF 61 "PHONICS GROUP" PUPILS AND 55 "LITTLE-PHONICS GROUP" PUPILS IN FOUR HIGH FIRST GRADES OF GREATER VANCOUVER, CANADA

	Test	Phonics group		Little-Phonics group		Difference M^1-M^2	C. R.
		M.	S. D.	M.	S. D.		
1.	Primary Mental Tests—mental ages (months)	88. 52	10. 24	86. 06	9. 54	2. 5	1. 3
2.	Spelling (June)	8. 88	2. 26	5. 06	2. 81	3. 8	7. 8
x3.	Spelling (November)	23. 94	8. 37	9. 06	8. 16	14. 8	9. 3
4.	Gates Primary Reading—Word Recognition	37. 74	9. 40	9. 86	7. 58	27. 8	17. 4
5.	Gates Primary Reading—Paragraph Reading	19. 38	4. 47	7. 60	4. 33	11. 8	13. 4
6.	Naming Capitals (Gates IX 10)	22. 21	6. 82	14. 44	9. 17	7. 8	5. 2
7.	Naming Lower Case Letters (Gates IX 11)	22. 03	5. 70	12. 95	9. 03	9. 1	6. 5
8.	Recognition of Word Seen (Gates VIII 2)	16. 46	3. 64	11. 47	3. 67	5. 0	7. 2
9.	Multiple Choice Word Recognition (Gates B_2)	14. 36	5. 40	7. 98	3. 40	6. 4	24. 6
10.	Perception Paired Words	22. 51	4. 23	18. 70	6. 24	3. 8	3. 7
11.	Giving Letters for Letter Sounds (Gates X 2)	22. 52	8. 59	9. 70	9. 53	12. 8	7. 5
12.	Giving Words ending with Stated Sounds (Gates X 4)	3. 23	2. 43	3. 11	2. 74	0. 1	0. 3
13.	Spelling Nonsense Syllables (Gates B_2)	5. 64	3. 24	1. 01	1. 82	4. 6	9. 4

[1] This test was given in the following semester when the pupils were in the low second grade.

visual and auditory perception as measured by the tests used, or that practice in visual and auditory techniques necessarily is the cause of good phonetic analysis and high early spelling achievement. It would seem rather that the visual and auditory techniques are part-and-parcel of the program of phonetic instruction conducted in the classes studied, and that separation into cause and effect is unwarranted. The chief point probably is that primary pupils may acquire a group of basic word skills which are necessary for success in reading, spelling and other language activities. If these are not acquired in the early school years, there is evidence to suggest that a succession of failures and maladjustments seems almost sure to result.[5] The present study emphasizes the importance, for spelling achievement, of acquiring a number of these language abilities early in the primary grades.

The close connections between early spelling ability and the group of language abilities here measured is shown in Table II. The table shows a consistently positive and, in many cases, rather close relationship between spelling ability, as measured on the Stanford test in November and the Gates reading tests, and the tests of visual and auditory perception, all given the previous May and June. Because of these positive, and often high, correlations, Table II, like Table I, underlines the importance of building up, in the primary grades, a group of verbal skills related to reading, spelling, word recognition and word analysis skills. Success in the language arts, in the early years of school at least, is probably based on a constellation of such abilities, some of which are here tested.

Table II suggests further that a formal test of spelling readiness is probably unnecessary in ordinary school practice. In the first place, an informal test of spelling ability is one of the easiest of all tests to give. Secondly, in this study the correlation between the informal test given in June and the spelling test given the following November is .83; this is almost as high as any other single r found or as a multiple R of .88 computed on a combination of some of the other tests. On the basis of the tests used in this study, an informal spelling test and the Gates Primary Reading Type I, given at the end of the first year of school, probably give as good a prediction as possible of spelling ability in the second grade.

[5] Dunklin, H. T., *The Prevention of Failure in First Grade Reading by Means of Adjusted Instruction*, Teachers College Contributions to Education, No. 802, New York, Teachers College, Columbia University, 1940.

TABLE II

CORRELATIONS BETWEEN SPELLING ABILITY IN THE LOW SECOND GRADE AND VARIOUS TESTS OF MENTAL, READING, AND PERCEPTION ABILITIES FOR PUPILS IN "PHONICS" AND "LITTLE-PHONICS" READING PROGRAMS

Correlation of Spelling Ability with	Total Group	Phonics Group	Little Phonics Group
1. Mental Ages	.41	.38	.55
2. Chronological Ages	.16	.11	.11
3. Gates Primary Reading—Word Recognition	.88	.85	.67
4. Gates Primary Reading—Paragraph Reading	.80	.78	.54
5. Naming Capitals (Gates IX 10)	.81	.71	.84
6. Naming Lower Case Letters (Gates IX 11)	.81	.62	.84
7. Recognition of Word Seen (Gates VIII 2)	.85	.72	.81
8. Multiple Choice Word Recognition (Gates B 2)	.80	.73	.62
9. Perception Paired Words	.59	.47	.46
10. Giving Letters for Letter Sounds (Gates X 2)	.87	.73	.86
11. Giving Words Ending with Stated Sound (Gates X 3)	.26	.34	.32
12. Spelling Nonsense Syllables (Gates B 2)	.85	.74	.74

This fact, of course, should not dissuade teachers and others from testing and diagnosis in the first grade. Gates, Bond and Russell suggest that "it is desirable to give a series of tests of important abilities and techniques at fairly frequent intervals from the time the pupil enters school until he has reached a satisfactorily high level of reading proficiency.[6] Brueckner says that "the most useful function of readiness tests in the field of both reading and arithmetic was not *prediction* of success but *diagnosis* of factors likely to interfere with learning."[7] Many of the tests used in this study may not be necessary for prediction, but they may be useful in diagnosis of individual difficulties or results of teaching procedures. For example, in test 9, in one class, fifteen out of twenty-seven pupils called *l* the letter *i*. The ad-

[6] Gates, A. I., Bond, G. L. and Russell, D. H., *Methods of Determining Reading Readiness*, Bureau of Publications, Teachers College, 1939, p. 53.

[7] Brueckner, L. J., "The Development of Readiness Tests in Arithmetic," *Journal of Educational Research*, XXXIV, September, 1940, p. 15.

ministration of these or similar tests should allow most teachers to adopt preventive measures in teaching and learning important language skills in the primary grades.

SUMMARY AND CONCLUSIONS

This study involves four first grade classes from average districts of greater Vancouver, Canada, selected because two of them had a reading program involving considerable work in "phonics" and two had a program using little "phonics." One hundred and sixteen pupils were given, either in the high first grade or later in the low second grade, a series of six group and seven individual tests of spelling, mental ability, reading, letter recognition, visual perception and auditory perception abilities. The results indicate that the group participating in the rather direct type of reading instruction involving considerable phonics and early practice in handwriting had reliably greater achievements in eleven out of twelve tests given and that ten out of the twelve tests had a correlation with spelling ability in the second grade ranging from 0.67 to 0.88. Some conclusions are:

(1) Spelling readiness seems to be acquired in the high first grade by most of the pupils involved in this study. Practically all of the pupils studied can spell ten words and their teachers estimate that two-fifths to one-half of them can spell fifty words by the end of their first grade careers. This ability is acquired without any formal work in spelling as such, but undoubtedly it is dependent upon a type of language arts program in the first grade that places considerable emphasis upon several types of language skills.

(2) A first-grade program of direct instruction in reading that includes early instruction in handwriting and phonetic analysis (with emphasis on both appearance and sound of words, syllables, and letters) produces better achievement in English spelling than a more incidental first-grade program involving little "phonics." (This study, however, does not offer evidence of spelling achievement beyond the second grade or compare growths in desirable social and emotional attitudes developed in the two programs.)

(3) It seems probable that habits of attention directed to parts of words, of seeing similarities and differences in words, of recognizing "word families," or other habits developed in a program emphasizing "phonics" are conducive to initial success in English spelling.

(4) Spelling ability in the second grades studied is closely related to abilities in word recognition and paragraph reading, to abilities in recognition of capital and lower case letters, to visual perception abilities such as distinguishing a word seen from other similar words or recognizing small differences in words, and to auditory perception abilities such as giving the names of letters sounded or spelling nonsense syllables.

(5) The closeness of the relationship between spelling ability in the second grade and the other abilities mentioned in (4) above is partly determined by the type of primary language program in which the children have participated. In the "phonics group," spelling ability is more highly correlated with reading ability than in the "little phonics group"; in the "little phonics group" spelling ability seems more closely related to chronological age and mental age. Differences between the two groups in the correlations between spelling ability and other abilities tested are negligible.

(6) A spelling readiness test as such is probably not needed in the primary grades because the beginnings of spelling ability can be tested directly and because spelling ability is closely related to reading ability as measured by the tests used in this study. Diagnosis of individual difficulties and preventive measures are, of course, still necessary.

(7) There exists a constellation of skills which can be taught and which seem basic to success in the language arts at least in the primary grades. Systematic instruction in these skills seems to have a favorable influence, not so much on separate subject-matter achievements as in the general area of language arts development.

EFFECT OF FORMAL SPELLING ON SPELLING ACCURACY

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Editor's Note: There has been some considerable discussion relative to the effectiveness of direct and formal methods of class instruction in spelling. The author presents data which seems to indicate that the normal growth of those without is about the same as those with such instruction.

DURING recent years numerous researches have been conducted to determine the particular words, the proper grade placement and the total number of words which should properly be included in the basic spelling list of the elementary school. Rice's[1] study was the forerunner of a number of studies which tended to prove that many words theretofore included in spelling lists should be eliminated because they were seldom used and seldom mastered.

The assumption seems to have been that if we would limit the list to those words most commonly used, the child would be able to master the spelling with a reasonable degree of effort. Numerous spelling "texts" were developed to include such lists. The child's growth in spelling ability was usually assumed to be due to the spelling instruction which took place during that part of the day especially set aside for spelling.

During recent years we have heard much about "incidental" learning, "functional" learning, learning through "use" and other expressions which would suggest that much of our learning probably takes place outside of the isolated periods set aside for a special type of training.

Which is more important in determining spelling accuracy, the learning that takes place in the "spelling period", or the learning that takes place rather incidentally in connection with the other experiences which the child has? This is not an easy question to answer, because with different pupils, different teachers and a different basic list of words the results vary.

The writer, with the cooperation of a group of elementary school teachers, attempted to arrive at a partial answer to this quesion. The plan was to compare spelling accuracy on a list of words which had been studied with that on a carefully equated parallel list of words which had not been studied during a special period set aside for spelling instruction. To rule out

[1] Rice, J. M. "The Futility of the Spelling Grind", *Forum*, 23, April and June, 1897, pp. 163–72, 409–19.

the effect of recent study or review it was decided to wait until at least a year after the words had been studied. Both lists were to consist of words commonly used in the writing of children.

For six years Superior (Wisconsin) had been using a widely accepted series of spelling texts.[2] The author of the series had developed a rather definite plan of instruction, and there is reason to believe that in Superior the plan had been followed with reasonable fidelity. The words in this list constitute the words that had been studied during the period especially set aside for spelling instruction.

To carry out the plan of the study it was necessary to have a parallel list of words which had not received special attention in the spelling period but which are in common usage in the writing of children. The writer used for this purpose a series of spelling texts[3] based on Rinsland's[4] comprehensive study of the writing vocabulary of children.

Since the two basic lists had many words in common, the first step in the program was a complete tabulation of the words in each list—grades two through six. Words common to both lists, regardless of grade placement, were eliminated. This left a much smaller number of words which were found to be included in one of the basic lists but not in the other.

The second step was to group the remaining words according to the grade placement assigned by the respective authors. The result was two lists of words for each of the grades. One list, hereafter, referred to as the "studied words" list, was composed of words found in the basic list studied by the elementary school children of Superior. The second list, hereafter known as the "incidental words" list, was composed of words included in the second series of spellers and based upon the Rinsland study. The words in this list had not been studied by the children in their regular "spelling" period.

Table I on page 286 indicates the number of words which remained in the fourth, fifth, and sixth grade classifications after the duplicates had been eliminated. These were the words from which the two sets of equated tests were to be developed.

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[2] Breed, F. S. and Seale, Ellis C. *My Word Book* (Chicago: Lyons and Carnahan, 1934).

[3] Rogers, Don C. *The Children's Word Book* (Chicago, Illinois: Wheeler Publishing Company, 1940).

[4] Rinsland, Henry D. *The Vocabulary of Elementary School Children of the United States* (University of Oklahoma, 1938). Mimeographed manuscript.

TABLE I

NUMBER OF WORDS FOUND IN ONE SERIES BUT NOT IN THE OTHER, TOGETHER WITH GRADE CLASSIFICATIONS DESIGNATED BY RESPECTIVE AUTHORS

Grade	Studied List	Incidental List
4	162	150
5	165	242
6	192	378

As a next step in the development of the equated tests, one hundred and fifty words were picked at random from each of the six groups included in the table above. So that for each grade group we had one hundred fifty words from the studied list and a like number from the incidental list. Each group was then divided into six parts of twenty-five words each, and the parts number consecutively from one to six.

These words were then incorporated into preliminary tests designed to furnish a measure of the relative spelling difficulty of each of the words in the two lists. These preliminary tests were administered to the children one grade below the grade for which they were designated. This was done for two reasons. First, it was necessary to have a group of children who had not studied either list. Second, in order to get a percentage of error high enough to make comparisons fairly reliable, it was necessary to administer the tests to a slightly younger group of children than those in the grade for which the words were intended. The tests were made short—twenty-five words each to avoid the effect of fatigue. Because of the number of words involved, it did not seem wise to test a single group on the three hundred words which was the total of the combined lists for a given grade. The schools of the city were, therefore, divided into two groups. Each group was tested on seventy-five words of the "studied words" list and seventy-five of the "incidental words" list. One group was tested on Parts I, II, and III of each list, the other group on parts numbered IV, V and VI. The tests were then administered over a six day period. The tests were administered to all of the children of a particular grade in a given building.

Table II on page 287 contains data on the preliminary tests. An attempt was made to divide the city in such a way that Groups A and B in each case would be comparable in the native ability and social background of the pupils, but in no case was a word on which Group A had been tested compared with a word on which Group B had been tested.

TABLE II

NUMBER OF CHILDREN WHO WERE TESTED IN THE PRELIMINARY TESTS, TOGETHER WITH THE GRADE CLASSIFICATION OF WORDS AND CHILDREN TESTED

Group	Grade Classification of pupils	Grade Classification of words	Parts of "Studied Words" List	Parts of "Incidental Words" List	No. of Children Tested
A	3	4	I, II, III	I, II, III	141
B	3	4	IV, V, VI	IV, V, VI	150
A	4	5	I, II, III	I, II, III	136
B	4	5	IV, V, VI	IV, V, VI	142
A	5	6	I, II, III	I, II, III	155
B	5	6	IV, V, VI	IV, V, VI	139

Following the administration and scoring of the tests, the errors for each group were tabulated. (Omitted words were counted as errors.) The percentage of accuracy was then calculated for each word. These are the data that were used in the development of the equated tests which were to be administered to children who had studied one of the two groups of words.

Some of the words of either list were spelled accurately by a high percentage of the pupils even though they had not studied them, others were misspelled by most of the pupils. It was rather arbitrarily decided to eliminate, as being too easy, words which were spelled accurately by over seventy-five per cent of this younger group. Similarly all words which were spelled incorrectly by over seventy-five per cent of the pupils were rejected because with only a few pupils showing mastery of the words, data for comparative purposes would have been unreliable.

Using the data of these preliminary tests, two parallel tests were developed for each of grades IV, V and VI. This was done by the process of matching. A word from the "studied words" list was matched with a word in the "incidental words" list which had been spelled with the same percentage of accuracy by an identical group of pupils who had studied neither word as part of their formal spelling list. Because perfect matches were sometimes impossible, a maximum difference of two per cent was allowed on individual pairings, but this was compensated for in later matchings. (Not all words of the preliminary tests could be used because in some cases matches could not be made.) The result was two parallel, equated

tests for each of the three grades. These tests had not only been equated on the basis of average difficulty, but more important perhaps had been equated on the basis of individual items.

TABLE III

NUMBER OF WORDS SELECTED FOR FINAL TESTS, TOGETHER WITH THE AVERAGE PER CENT OF ACCURACY WITH WHICH EACH GROUP WAS SPELLED BY CHILDREN WHO HAD "STUDIED" NEITHER GROUP

Grade Classification of Children Tested in Preliminary Tests	Grade Classification of Words	Number of Words in Each of the "Final" Tests	Average Per Cent of Accuracy With Which Words Were Spelled on Preliminary Tests		Grade Classification of Children Who Took Final Tests
			Studied List	Incidental List	
3	4	70	46.1	46.1	5
4	5	76	53.5	53.5	6
5	6	62	50.5	50.5	7

Table III furnishes data on the words that were used in the "final" tests. That is, the fourth grade words were equated by testing third grade children. There were seventy words in the "studied words" test and a like number in the "incidental words" test. The third grade spelled the words which were used in the "studied words" list with an average accuracy of 46.1 per cent and the "incidental words" with an average accuracy of 46.1 per cent. Because we wished to rule out the influence of recent study or review, the final tests were given to children in the fifth grade who had studied the one group of words the year before.

TABLE IV

A COMPARISON OF THE ACCURACY WITH WHICH THE SAME CHILDREN SPELLED TWO GROUPS OF WORDS. ONE GROUP HAS BEEN "STUDIED", THE OTHER HAD NOT

Grade Classification of Children Tested	No. of Words in Each Test		No. of Children Tested	Per Cent Accuracy on "Studied" Test	Per Cent Accuracy on "Incidental" Test	Difference in Per Cent Accuracy
	Studied	Incidental				
5	70	70	289	75.89	71.70	4.19
6	76	76	303	82.56	79.14	3.42
7	62	62	333	82.75	77.90	4.85

To reduce the fatigue factor to a minimum each test was divided into two equal parts, so that each child was tested in four sittings rather than two.

Table IV on page 288 furnishes data on the final tests. It will be noted that in each case the words which had been studied were spelled with a higher percentage of accuracy than those which had not. This difference is, however, in no case greater than five per cent. If the reader will compare tables III and IV, he will note that this is less than one-fifth the growth that took place over a two year period without formal instruction in spelling.

The assumption that growth in spelling accuracy can be attributed solely or in the main to formal spelling instruction is not borne out by the evidence collected in this study. If a special period of the day, devoted to spelling, is therefore to be justified, it would seem necessary to justify it on grounds other than the contribution that it makes to the improvement of spelling accuracy. That special spelling instruction may have other values is neither confirmed nor denied by the evidence. We have shown only that a special spelling period devoted to the study of a basic list of words has only a limited influence on spelling accuracy.

THE EFFECT ON SCORES OF WARNING JUNIOR HIGH SCHOOL PUPILS OF COMING TESTS

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Editor's Note: Many persons have been interested in the educational and emotional effects of tests upon school pupils. The authors find slightly improved scores from announced tests.

School procedures in general suggest that teachers and administrators believe that students will gain higher scores on the average if they are warned of coming tests. This seems to be true for unit test, mid-terms and final examinations. For instance, regular classes are frequently cancelled several days before final examinations are to begin, and the schedule of examination times has probably been in the hands of the students some time before this. The value of warning is voiced by Lee:[1]

"Another device that has a favorable effect on the learning of pupils is to inform them that a final examination is to be given. In an experiment on the college level the group who expected a final examination did markedly better on it than the group not expecting the final check-up."

Unfortunately Lee does not give the author or the title of the study, so that it is not possible to determine the exact nature of the warning. Lee then goes on: "Another inference which can be made from the same study is that more learning takes place when pupils expect a test than when a test is sprung on them."

In many school systems the course of study is divided into units, and promotion by recommendation to the next grade is contingent upon the successful "passing" of, or satisfactory letter grades on, tests given at the end of each unit. Very frequently these tests are final tests on the aims and materials of each unit, so that, if Lee's conclusion is valid, teachers should warn students of the tests in order to ensure that as much learning as possible will take place. His statement is, however, a rather general one, and raises several other questions. Is the generalization valid for all educational levels, elemen-

[1] J. M. Lee, *A Guide to Measurement in Secondary Schools*, New York, Appleton-Century, 1936, p. 327.

tary, junior and senior high school, or just for the college level at which the study he mentioned was carried out? Does he mean that teachers should warn students that a final test is to be given on a certain specified date, or is it sufficient for them to know that they will have a final test at some time in the future? Pease[2] reported a study at the senior high school and college level in which he told a group of students that they would have an objective test at the next regular class meeting, and then sent them to a study room to "cram" for an hour. He gave a matched group of students the same test without warning. He found that the average score of the latter group was significantly lower than that of the former group, concluding that "it pays to cram." However, his procedure is not the one usually found in actual teaching practice, and therefore it cannot be concluded that more learning takes place if the teacher simply tells the students that they will have a test two days hence. Knowledge of an impending examination guarantees neither that the students will study nor that they will cram.

PURPOSE OF THE PRESENT STUDY

The present study attempts to answer the question: What is the effect on test results of warning junior high school pupils that they will have a unit test on a certain date? It compares the test scores of these students with the scores of comparable sudents who were given no warning beyond the fact that they knew it was general practice to have a unit test at the conclusion of the unit.

The investigation was carried out in 17 different classes in grades 7, 8 and 9 in three different schools. All students were aware that it was customary to have a test at the end of each unit. In addition it was usual to tell them the specific date of the examination at least two days before it was administered. For purposes of the study the experimental group was given the test (without specific warning) on the day that the members of the control group were told that they would have the unit test at the next regular meeting of the class.

There were 80 students in each group in grades 7 and 8, and 76 in grade 9. Individuals in each group were paired on the basis of IQ (since the original test scores were not available). The members of each pair

[2] G. R. Pease, "Should Teachers Give Warning of Tests and Examinations?" *Journal of Educational Psychology*, Vol. 21, (April, 1930), pp. 273–277.

(matched for sex) had taken the same intelligence test, either the Terman Group Test or the Otis Intermediate Examination. The groups were then equated for averages and variabilities on the following factors: chronological age, general academic achievement for the first term of the 1941–42 school year, scores on the mid-term tests in general science, and scores on the Analytical Scales of Attainment in Elementary Science. The means in all instances were practically identical and the critical ratios for the differences between the standard deviations varied from 0.00 to 0.57.

When the time for testing arrived, those students who were to form the experimental group were sent to another room and given the test, and the other members of the class were told that they would have their unit test at the next class meeting. The members of the unwarned group were told that their letter grades for the science unit being studied depended upon their test scores. They were also warned not to pass on information about the test to the other members of the class, for if they did their own letter grades might be lowered as a result. This point was carefully stressed, and in view of the final results, it would appear that these students had not given out any information about the contents of the test.

Six weeks later a retest was given to both groups, without warning or review. There were, of course, a few less students in each group because of withdrawals and removals. The individuals in each group were, however, still paired on the basis of IQ, and the averages and variabilities of the two groups in the factors listed above were still comparable.

TEACHING AND TEST MATERIALS

Teaching materials and methods were constant for both control and experimental groups within each grade in each school. For example, the same teacher taught all the grade 7 classes in any one school, and members of both groups would be found in each of the grade 7 classes. The same situation held in the other grades.

All schools participating in the investigation customarily use typical new-type items in the unit tests. Items of a similar nature were used in the tests prepared for the study. The examinations also included another type of item in which a problem situation was described and all data necessary for the solution of the problem were given. Students were required to judge the validity of a group of statements based on the data. This item was in

the nature of a "thought" or interpretative question in that it dealt with material that had not been discussed in the course of the unit. It was designed to test the ability of the student to reason about novel data. It was included to see if the warning might not influence scores on memory type items more than on items of a "thought" nature.

After the tests had been prepared they were tried out in several other schools. An item analysis was carried out[8] and doubtful items were revised or discarded. There were 92 items in the grade 7 test; 85 in grade 8; and 86 in grade 9.

FINDINGS

The test results were analyzed separately for the different grades. Table I gives the means and standard deviations of the control and experimental groups on the total test. Columns 6 to 9 inclusive give data relative to the differences between the mean scores.

TABLE I

MEANS AND STANDARD DEVIATIONS OF TEST RESULTS FOR BOTH GROUPS

Grade	Control		Experimental		Diff.	σ_d	CR	Chances in 100 of significant diff.
	Mean	S. D.	Mean	S. D.				
7	43.0	11.71	42.7	10.61	0.3	1.19	0.25	60
8	43.0	9.04	40.9	9.64	2.1	1.13	1.85	96
9	50.8	9.72	49.7	9.74	1.1	0.99	1.11	86

[8] The formula used was $\sigma_d = \sqrt{\sigma_{m^2_1} + \sigma_{m^2_2} - 2r_{12}\sigma_{m_1}\sigma_{m_2}}$

It will be noted that the obtained differences are all small, varying from 0.3 to 2.1 points. While none of the differences is significant it is true that all the obtained differences favor the control group. The standard deviations for the two groups are also very similar. It does not appear that knowledge of a forthcoming test had much influence on the test results of these students.

Table II shows the data obtained on the retest six weeks after the completion of the unit.

[8] John A. Long and Peter Sandiford, *Validation of Test Items*, Bulletin No. 3, The Department of Educational Research, University of Toronto, 1935.

TABLE II

MEANS AND STANDARD DEVIATIONS OF RETEST RESULTS FOR BOTH GROUPS

Grade	Control		Experimental		Diff.
	Mean	S. D.	Mean	S. D.	
7	44.1	10.74	44.2	12.74	−0.1
8	42.4	9.14	40.7	9.55	1.7
9	50.3	8.67	50.1	9.61	0.2

Since the differences are even smaller than those obtained on the first administration of the test, and since the variabilities are very similar it was not thought to be necessary to compute any critical ratios. None of the above differences, then, is significant. It is of interest to note that there was comparatively little change in average scores after the six-week interval.

Table III shows the data relative to the "thought" or interpretative question for both the test and the retest.

TABLE III

COMPARISON OF GROUPS ON "THOUGHT" QUESTION

Grade	Test		Retest	
	Control	Experimental	Control	Experimental
	Mean	Mean	Mean	Mean
7	5.5	5.5	5.7	5.9
8	7.3	6.1	7.4	6.7
9	4.7	4.6	5.1	5.2

In only one case does the difference between the control groups and experimental groups approach significance, namely in the case of the grade 8 test results where the difference is 2.92 times its standard error. Although the number of items in this question was too small to give reliable results, it appears that lack of warning of coming examinations has little detrimental effect on the results of items of this nature. Further study with this type of item is necessary to determine the effect of warning on test scores.

The reliabilities of the tests were computed by the split-half method (stepped-up) and by correlating test with retest results. The reliability coefficients are shown in Table IV.

TABLE IV

TEST RELIABILITIES

Grade	Split-half	Test-Retest
7	.87 ± .013	.85 ± .015
8	.82 ± .018	.79 ± .020
9	.84 ± .015	.84 ± .017

It is of interest to note the similarity of these coefficients computed by the two methods.

SUMMARY

Matched groups of pupils in grades 7, 8 and 9 were taught selected units in general science. One group was given a test, without specific warning, after approximately six weeks of instruction. The other group was warned two days in advance when they would have their regular unit test. Six weeks later both groups were again tested with the same test without any review and without warning.

It was found that the obtained differences in average scores favored the warned group but that they were not significant for either the test or the retest results. However, since all the differences on the first administration of the test favored the control group and since in two instances the probabilities of significant differences were rather large (86 and 96 in 100) we are justified in the following conclusion: the average scores of junior high school pupils on unit tests in general science may be increased slightly, but only slightly, (approximately one to two per cent) by giving specific warning of the date of the examination two days before it is to be administered. This result seems especially significant, since we might expect emotional disturbance to lower the scores of students confronted with an unexpected test.

Several problems arise from this study. How can we account for the small differences between the average scores of the warned and unwarned groups? Two answers suggest themselves. It may be that junior high school pupils are not motivated to study for unit tests, or it may be that they do not know how to study. The influence of instruction in methods of study on test results should be investigated. Another investigation might be the

comparison of warned and unwarned students of high and low intelligence to determine if bright students benefit more than slower students from warnings of coming examinations. The hypothesis that the practice of giving tests without warning might lead to more effective learning once the pupils become accustomed to such a procedure should be tested. Finally, the various problems might well be investigated at both higher and lower grade levels.

STANFORD BINET RETESTS OF GIFTED CHILDREN

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Editor's Note: Numerous retests have been made of pupil of average and below average intelligence. The author presents data of retests of gifted pupils.

NUMEROUS reports have been made of retest results ever since the Stanford Binet test became widely used in rating school children, institutional and clinical cases. A comprehensive summary of these results is given by Hildredth (2) by Jersild (3) and others. Retest studies of school populations where the median I.Q. averages approximately 120 have been made by Rugg and Colloton (6), Hildreth (2) and Thorndike, Hildreth, Flemming and Stanger (8).

Comparatively few reports have been made of retest data for gifted child populations in which all cases tested orignially above 120 or 130 I.Q. Terman (7) retested 84 gifted children after six years and found a loss for the boys of three points on the average, for girls, 13 points. This loss was largely attributable to the age of the children at the time of the second test. Terman took this factor of declining I.Q. in the older age levels into consideration in selecting children for his study of the gifted in 1922. (See *Genetic Studies of Genius,* Vol. I)

Lincoln (4) found that the gifted (those testing 119 I.Q. and over) showed more loss than gain on retests, the girls showing more loss than the boys.

Cattell (1) analyzed Stanford Binet retest data for gifted, average and dull pupils. Her data show a positive relationship between the size of the I.Q. and change in I.Q. in a positive or negative direction. The higher the I.Q., the higher the median I.Q. change on retests. The dull tended to lose instead of gain with increase in age.

NEW DATA ON STANFORD BINET RETESTS OF GIFTED CHILDREN

Data that were available to the writer afforded an opportunity for new studies of Stanford Binet retests with gifted children. In a private school enrolling a highly selected population where the Stanford Binet tests have been used since 1918, there were many children who rated 130 I.Q. and above on one or more Stanford Binet tests. 130 I.Q. was arbitrarily chosen as the dividing line for a study of retest results. Among the cases are gifted

children who have had one or more 1916 revision tests and one or more 1937 revision tests. There is a somewhat smaller group of gifted children in the same population who have had two or more 1937 revision tests.

The interval between tests ranged from one to ten years with approximate medians for the three different groups as follows: Group I, both tests 1916 revision, median interval, a little over three years: Group II, one test 1916, the other 1937 revision, median interval three years; Group III, both tests 1937 revision, median interval between tests, four years.

In each category certain children had had more than one retest. In these cases comparisons were listed for the first test with each successive one, and the last two. To get the difference between early and later I.Q.'s, the first test I.Q. was subtracted from the last. All I.Q.'s of older children were left "uncorrected" for decline with age.

The distributions of I.Q. changes are shown in Table 1. For these distributions the median changes, the quartile deviations and the semi-interquartile range or Q were computed. The median changes for Groups I, II and III were found to be 6.5 points, 19.75 points and 15.4 points, omitting comparisons of those children who were over ten years of age at the time of both tests.

For the 1916 retests the results are little different from those reported by Rugg and Colloton (5), Hildreth (2) and Thorndike, Hildreth, Flemming and Stanger (8) for the total population from which these cases were drawn; but the I.Q. changes for 1916–1937 retests and for two 1937 retests show greater variability.

In each case, 1916–1916 test comparisons, 1916–1937 and 1937–1937 comparisons, the data were divided according to the age of the child when tested. This division was arbitrarily made as follows: (1) both tests below ten years of age, (2) one test below ten, one over ten, (3) both tests over ten years of age. Such a division affords an opportunity to study the affect of age on the three sets of test comparisons.

As was to be expected from earlier studies, retests over ten years of age for the 1916 Stanford Binet showed marked decline in I.Q. These results are shown in Table I, column 3. There are only two such cases of decline in the 1937–1937 retests and none in the 1916–1937 retest comparisons. The percentages of comparisons showing positive gains in each category, 1, 2 and 3 (first two columns only, for 1 and 2) were: 1, 63.9%, 2, 88% and 3, 76%.

TABLE I

I. Q. CHANGES OF GIFTED CHILDREN

Points of I Q change	Group I 1916–1916 Tests: Both Tests under 10 yrs.	Group I 1916–1916 Tests: One test over, one under 10	Group I 1916–1916 Tests: Both tests over 10 yrs.	Group II 1916–1937 Tests: Both Tests under 10 yrs.	Group II 1916–1937 Tests: One test over, one under 10	Group II 1916–1937 Tests: Both tests over 10 years	Group III 1937–1937 Tests: Both Tests under 10 yrs.	Group III 1937–1937 Tests: One test over one under 10	Group III 1937–1937 Tests: Both tests over 10 years
Over 50				1			1		
48									
46									
44				1	1				
42									
40									
38	1	1		1			1	1	
36	1	1			1			1	
34				1					
32	1			1			1		
30	1	1		2				2	
28	3								
26		1						1	
24		4	2	2			1	2	
22	4						2	4	
20	6	2		3			1	1	
18	5	3	2	1					
16	3	7	1	2	1		1	3	
14	6	4	1				1	1	
12	5	7	1	1				3	
10	10	6	1	2					
8	9	9		1			1		
6	9	4	2	1					
4	5	4	3				1		
2	7	7	1				1	1	
0	6	8	8	1		1		1	
— 2	6	7	9				1		
— 4	4	2	8						
— 6	5	3	9	1				1	
— 8	4	7	3			1			
—10	3		7						
—12	3	6	7	1			2		
—14	4	1	6						
—16	1	2	1					1	
—18		3	5	1					
—20		1	4						
—22			2						
—24		1					1		
Over —24	2	3	1						
Total	114	105	84	24	3	2	16	23	
Medians	6.8	4.75	—5.0						

	Columns I and II	Columns I and II	Columns I and II
Highest positive difference	39	54	56
Q3	13.6	29.75	22.6
Median	6.5	19.75	15.4
Q1	—2.6	10.25	2.25
Highest negative difference	—55	—17	—37
Q or Semi-interquartile range	8.1	9.75	10.18
Total Number	219	27	39

For the 1916-1916 retests the factor of age is already beginning to count in the category of gifted children under ten and over ten at the time of the first and second tests, respectively.

The 1916–1937 rests showed the greatest variability, the widest deviations of any of the three sets of comparisons. It was to be expected that greater I.Q. changes would be found when comparisons were made between a 1916 Stanford rating and a 1937 rating than betwen two 1916's or two 1937's, because the 1937 Revision rates all children in the middle age range slightly higher in terms of I.Q. points than the 1916. (See Terman and Merrill: *Measuring Intelligence*. Boston: Houghton Mifflin, 1937).

What factors account for the differences in I.Q. change when the retests within the three categories are compared? Not all the greater deviation of category 3 is attributable to differences between the two editions of the test. The following factors must also be taken into account in evaluating the results:

1. One examiner did the largest number of original and retests in the 1916–1916 tests. Fewer cases were reexamined by a different person than in the other groups. For the 1916–1937 retests, nearly all the tests were done by two different though equally competent examiners. The same thing is true of the 1937–1937 retests.

2. The examiner who made the 1916–1916 retests had full knowledge of each child's previous test scores as was not usually the case in the other comparisons.

3. In the 1937 retests the two forms were used in about equal proportion, but using two forms introduces another variable. Form L was not invariably used following Form 1, nor form M cases retested with form M.

4. The median interval between retests was slightly shorter for the 1916–1916 retests, longest for the 1916–1937 comparisons.

5. In the 1916–1916 comparisons there were more cases of children who had had more than one retest, results of which were tabulated in the distributions.

6. There are five to eight times as many cases in the 1916–1916 comparisons as there are in the other two sets of retest data. One hundred comparisons in both the 1916–1937 and 1937–1937 comparisons might insure more stability in the findings.

Data recently published by McNemar (5) which furnish a statistical analysis of the standardization data for the revised Stanford Binet Scale indicate that the reliability of the I.Q.'s obtained with the test will be higher the lower the I.Q., that the ratings of gifted children will tend to be more unreliable than those of the mentally retarded.

CONCLUSIONS

These results have most practical bearing on the selection of children for classes for the gifted. In large urban centers the general practice is to place in such classes those who rate over 130 I.Q. Whether or not 130 is the appropriate point need not be argued here. This practice may work to the disadvantage of the child who is young when tested, or who has not had a series of Binet tests. A child might at age eight rate 128 I.Q. There is a considerable chance according to these results, that three years later he might rate 150. Yet for three years he would have been excluded from the class for the gifted.

There is a smaller chance that the child rating 132 on the first test, and therefore considered gifted enough for enrollment in a special accelerated class will prove on retest to rate 122 I.Q.

"What's his I.Q.?" is scarcely a fair question to ask about a gifted child. The safer question is: "What are his I.Q.'s on several successive tests? No one I.Q. ever indicates exactly any child's tested ability. When the gifted are under consideration this generalization is all the more true.

For practical purposes in evaluating the mental status of presumably gifted children the safer practice would be: 1. to obtain successive ratings several years apart, and 2. to supplement the Binet ratings with developmental and observation data as a means of determining more reliably the child's position in the range of mental ability. The need to express Stanford Binet test results as decile ratings, or in broad A.B.C. categories or standard scores so that teachers and others using I.Q. will not be confused by I.Q. changes or retests, is also indicated.

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VOCATIONAL CHOICE AND COLLEGE GRADES

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Editor's Note: What effect has the choice of a vocation upon college grades? The author finds that those with tentative choice were high in aptitude and college grades.

THE student who comes to college to prepare himself for a definite vocational field may have an advantage over the student whose vocational goal is still undecided. The pursuit of such a definite personal objective may be thought to increase the student's incentive to study and may also serve to give meaning and relationship to knowledge and principles.

In a previously published study* of this problem the results seemed to indicate that students who had definite vocational choices made higher grades in college than their fellows whose vocational choices were not made. This study, however, had a number of serious weaknesses. It used the questionnaire technique to secure data from students. Moreover the questionnaire called for information which could only be obtained by the student by the recall of events, vague and subjective, going back over a period of three or four years. So it seemed desirable to repeat the study starting with a class of incoming freshmen, using the interview rather than the questionnaire, making a comparison after each interview period, and carrying on the study until the students had completed four years of college, when most of them would graduate.

The students were all men. In 1937, 270 of them entered college; in 1941, 124 of them completed four years of college work. During each of the four years they were interviewed individually to find out if they had made a choice of a vocation (definitely, tentatively, or not at all) and when the choice was made. To lessen the demands on retrospection these interviews were made during the first semester of the freshman year to find those who had chosen before entering college, near the end of the second semester of the freshman year and at the middle of the sophomore, junior and senior years. Then, for each student, grades for each semester were recorded and averaged and his score on the American Council Psychological Examination, given at entrance to college, was secured.

* Marshall, M. V., The Life-Career Motive and Its Effect on College Work, Journal of Educational Research, April, 1936, p. 596. Ibid., A Note on "The Life-Career Motive and Its Effect on College Work", Journal of Educational Research, May, 1937, p. 703.

With these data in hand analysis was made for each semester. Students were classified as having definite or tentative vocational choices, or as undecided. Then for each of these groups the average mark on the psychological examination and the average of the students' averages of grades were computed. The results for the eight semesters are given in Table I.

TABLE I

SHOWING, FOR EACH SEMESTER, THE PROPORTION OF THE CLASS WHO HAD DEFINITE OR TENTATIVE VOCATIONAL CHOICES OR WHO WERE UNDECIDED, WITH THE AVERAGE MARK ON THE PSYCHOLOGICAL EXAMINATION AND THE AVERAGE SEMESTER GRADE

Semester	Choice	Per cent of class	Average score on Psych. Exam.	Average Grade
1	Definite	34%	158	1.59
	Tentative	31%	172	1.91
	Undecided	35%	161	1.76
2	Definite	39%	160	1.85
	Tentative	28%	180	2.17
	Undecided	33%	164	1.54
3	Definite	40%	160	1.89
	Tentative	29%	175	1.91
	Undecided	31%	157	1.49
4	Definite	43%	164	2.09
	Tentative	34%	179	2.14
	Undecided	23%	183	1.89
5	Definite	46%	167	2.16
	Tentative	33%	181	2.33
	Undecided	21%	178	2.14
6	Definite	45%	175	2.34
	Tentative	36%	189	2.42
	Undecided	19%	182	2.29
7	Definite	57%	170	2.48
	Tentative	29%	175	2.44
	Undecided	14%	161	2.00
8	Definite	57%	174	2.63
	Tentative	29%	188	2.44
	Undecided	14%	159	2.15

It is seen that the typical freshman class contains about one-third with definite vocational decisions, one-third with tentative decisions, and one-third who are undecided. Throughout their four years in college the proportion with tentative decisions remains relatively constant while the proportion with definite decisions increases and the proportion who are undecided decreases. But even in the last semester before graduation 14% of the class were still undecided as to their vocational preference.

Those with definite choices were lowest on the psychological examination for five of the eight semesters. Evidently the student of limited academic ability is the one most likely to have a definite vocational decision. But an inspection of the third column of the table shows that, whereas these students with definite decisions were lowest on the psychological examination for more than half of their college careers, they were lowest on their average college grades for only one semester out of eight, and they stood highest for the last two semesters. Evidently some factor is operative in their cases to compensate for relatively low academic ability. It may well be the incentive of a definite goal.

The most striking conclusion revealed by this study is the high standing of those with tentative vocational choices on the psychological examination. They were the highest group for every semester, save one. Evidently the possession of high intelligence and the making of tentative decisions are some way associated. Consideration of the average grade shows that high standing on the intelligence test bore academic fruit in the achievement of high grades for the first six semesters; for the last two semesters the tentatives fell to middle place while the definites rose to high place.

The standing of the undecideds ranges from mediocre to low from semester to semester, with low predominating. On the measure of acedemic ability they were the middle group for four semesters, the low group for three semesters and the high group for only one semester. On academic achievement they stood low for all semesters but one. Evidently the lack of a vocational decision is not only associated with poor academic results but the results are even poorer than measures of academic aptitude would justify anticipating.

GENERAL CONCLUSIONS

1. College students with definite vocational choices rank relatively mediocre in academic aptitude but their academic performance, as measured by grades, is mediocre and high.

2. College students with tentative vocational choices rank high in both academic aptitude and in college grades.

3. College students who are undecided about their vocational choices rank relatively mediocre or low in academic aptitude but their academic performance, as measured by grades, is consistently low as compared with students with either definite or tentative vocational choices.

EDITORIAL

WHAT IS NEEDED IN EDUCATIONAL RESEARCH?

WERE it only by virtue of the momentum already built up by agencies and institutions devoted to educational research, we might assume that such activity will continue indefinitely and will tend to expand its scope. There is hardly likely to be any dearth of material for investigation. For years to come, the effects which the present war is having upon education—as well as the influence of education (of various kinds) upon the war—should furnish an abundance of subjects for study. Then there will still be problems which, if not new or especially topical, are waiting for much more thorough examination than they have yet begun to receive. As an example of the more technical sort, there is the whole matter of systems of marking. For those who have the courage, the preparation, and the ability to undertake really fundamental issues, infinitely more profound than mere quibbles as to method, machinery, or "technique", there are the problems of what subjects should be taught, how much of them, when, and to whom.

Especially to be hoped for is a considerable improvement in the quality of work done under the name of research. That name has indeed been applied far too loosely; it needs to be carefully defined. The true criteria must be clearly recognized, and the distinct kinds of research sharply set off. Also there must be better realization of the fact that not everyone who has managed to earn a university degree is necessarily equipped to find out things worth finding out. And after reading vast numbers of reports in professional publications, one is sometimes tempted to propose that people who investigate education should first be educated themselves.

We have heard it frankly admitted by professors in graduate schools of education that many of the projects assigned to their students were probably of no intrinsic importance, and not in themselves worth the time spent upon them. The defense of such practice has been the training afforded in "methods" and "techniques" of research. Yet one may seriously question

the benefit to the individual (there is surely none to anyone else) of so-called research which is not an attack upon a genuine problem. Moreover, this kind of training in method itself seems highly questionable. For the great truth to be kept in mind is that the proper method of solving any particular problem is determined by the nature of that problem, just as the right way of going about any task is not something to be decided by the worker, but is inherent in the material to be handled, in view of the result to be attained. Mere method in the abstract can mean little more than general principles of common sense which a person of reasonable intelligence might be fairly well trusted to apply in any case.

If educational research has sometimes been regarded slightingly, the unfavorable opinion has not been entirely undeserved. To merit the respect which is vital to its successful continuance, it will have to exhibit sounder performance than what has too often appeared. With all the serious work there is to be done in the world, there is little time for mere tinkering, for dummy projects conceived for research' sake. The intelligence of a searcher manifests itself first in his choice of a subject, in his limiting it to a sharp focus, along with the recognition of his degree of competence to undertake it. Then we need the kind of investigation which follows through to a reliable conclusion, not merely inconclusive dabbling.

An obvious fault of much alleged "research" has been the gross abuse of statistical methods. Imposing mathematical superstructures have been built up on the flimsiest of foundations because account was not taken of the simple but axiomatic principle that no valid statistics can be compiled about things which do not have a standard and real unit of measurement. Collections of questionnaires, facts and opinions which vary in their significance with each individual, may be manipulated so as to yield pseudo-mathematical tables or graphs, and these may be discussed in technical language so as to take on an air of "scientific" findings, but they are extremely likely to be little more than synthetic abstractions quite divorced from all deep realities of human life. Educational research worthy of the name will not be accomplished by mechanical carrying on with arbitrary rules of thumb, however cunningly these may be devised. It requires imagination and a keen sense of human values; without such qualities in the inquirer, there cannot be much hope of benefit to the adventurous enterprise, both individualistic and social, which education ought to be.

Research in education must be recognized as different in its nature from the sort of thing that is carried on under that name in scientific laboratories. It will not bring us salvation by adding-machines and piles of *paperasses*. As in the profession of medicine, we can arrive at safe generalizations only by inductive methods, by the accumulation of honest, intelligent, and painstaking case-studies. What is commensurable will be measured, but the ascertainable data of human development are to be considered always from a point of view that takes in much else besides. And if the quality of educational investigation continues to improve, some of our investigators may be less cocksure about their discoveries. Perhaps the greatest lesson to be learned from colleagues in more definitely scientific fields is the lesson of open-minded humility. While we have good reason to believe that important things will be found out in our day, and maybe more important things in the distant future, yet we should never forget that there were many highly-educated people, and effective systems of education, before any conscious attempt was ever made at "educational research".

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Address research bulletins and other communications to A. S. Barr, Department of Education, University of Wisconsin, Madison 6, Wisconsin.

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An annotated, classified, and selected list of books about the background and problems of American education, sponsored cooperatively by the National Education Association and the Book-of-the-Month Club.

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Research News and Communications

Address all research news and communications to Carter V. Good, Teachers College, University of Cincinnati, Cincinnati, Ohio.

Policies Commission.—The Educational Policies Commission published in May of 1943 a booklet, *Education and the People's Peace*. This report makes definite proposals as to the ways in which organized education can contribute to a just and lasting peace. In order to facilitate discussion and action on these proposals, a study guide to accompany the booklet has been prepared recently. It is designed to be used by any organization interested in planning programs to consider education's part in world organization. The guide contains a summary of *Education and the People's Peace*, suggested ways of using the report, questions for discussion and study, a bibliography, and a questionnaire.

The urgent need for pre-school care for young children of working mothers during this war period has stimulated interest in the large problem of pre-school education. The Educational Policies Commission is preparing a publication that will examine the possibilities of pre-school education, not only as a war emergency measure, but as a permanent part of the public-school system. It will inquire into such questions as whether the years of early childhood are important in the educational process. What, if any, contribution can pre-school education make to the child's emotional, intellectual, and physical development? What are the effects of such schools on the interest and responsibilities of parents, and what should be the relation of these schools to other community functions and developments?

Other reports that the Educational Policies Commission is in the process of preparing include a consideration of: (1) the role of the schools in meeting the emergency of juvenile delinquency, (2) the relation of the schools to the retraining and rehabilitation program, (3) curriculum changes that will be desirable on the return to peace, and (4) a constitution for American education.

General Education.—During the past year the Cooperative Study in General Education (sponsored by the American Council on Education) has engaged in three major kinds of activity, namely: (1) the development of inventories for determining the status of students with reference to certain objectives of general education; (2) the issuance of a number of bulletins and special reports; and (3) the organization of a summer workshop for college teachers, faculty counselors, and administrators. Through visits to colleges and intercollege committees, members of the central staff collaborate with members of the faculty in the eighteen cooperating colleges in developing and executing plans. Members of the central staff are now writing final reports of the Study, which terminates on August 31, 1944.

Development of New Inventories.—During the last year the study developed

four inventories in the humanities, namely: religious concepts, satisfactions found in reading fiction, checklist of novels, and inventory of the arts.

The inventory of religious concepts deals with the beliefs that students have with regard to such matters as conceptions of God, historic Christian doctrines and practices, the Bible, the church, the economic order, the use of force as in war, personal sense of worth, and personal freedom.

The inventory of satisfactions found in reading fiction rests upon the assumption that the study of literature is really effective only if, after graduation, the student continues his education through the reading of literature. Accordingly, the inventory determines the extent of student satisfactions, such as relaxation and pastime, escape, association, technical-critical satisfactions, self-development, intimate personal information, socio-civic information, and philosophic and religious information. This inventory, when used in conjunction with the checklist of novels, affords some insight as to the depth or level of the satisfactions that a student asserts he secures from the reading of fiction.

The inventory of the arts seeks to determine the design of the beliefs of students regarding the values of the visual arts.

In the social sciences the inventory of beliefs about post-war reconstruction is an attempt to answer certain questions: What types of social knowledge are required in order that we may meet the problems of the post-war world? How can social science instruction best be carried on to make this knowledge available? The inventory relates to the attitudes of students regarding such topics as the power of individual groups, isolationism, internationalism, our enemies, our allies, foreigners, "inferior" peoples, domestic racial minorities, labor, militarism, and futility in peace and planning. It provides information as to the beliefs students hold, as to whether the beliefs of students are consistent or confused, and as to the social science information upon which they base their attitudes. The inventory indicates the ability of students to make valid discriminations and reveals the unwarranted uncertainty they may feel.

In student personnel and counseling two new inventories have been developed, namely: interests in wartime problems, and counseling relations. The first inventory assumes that the interests of students in wartime problems may be viewed as goals of general education, that these interests are also important from the point of view of motivation and methodology, and that they are indicative of opportunities for teaching the students to organize their learning in terms of a major problem of living. The items of the inventory deal with personal concerns and with broader social problems. In each of these two groups of questions there are several subordinate groupings. Under social problems, for example, the questions relate both to present social problems and to concerns about post-war reconstruction.

The inventory of counseling relations is based upon the assumption that the function of faculty counselors is to facilitate the student's accomplishment of five developmental tasks, namely: developing social relations, developing a philosophy of life, developing vocational orientation, developing an understanding of the body, and developing the ability to succeed in college. Accordingly, the inventory secures the student's estimate of his satisfaction with counseling experiences that he has had, and his desire for experiences that

have not as yet been a part of his counseling. The inventory also yields information as to the extent to which counseling has resulted in passive acceptance of the suggestions of counselors, as opposed to active response.

Bulletins and Special Reports. — The central staff has issued bulletins descriptive of these inventories and of results obtained from their use. It has also prepared bulletins containing proposals regarding the problem of maintaining effective general education in wartime and, particularly, about the nature of the current task of general education in the humanities, in the social sciences, and in student personnel and counseling. Two fellowship reports have been issued, one dealing with "An Exploration in Student Self-Appraisal," by John R. Smithson of Ball State Teachers College, and the other dealing with "The Development of a General Course in the Physical Sciences," by Richard I. Rush of Centre College.

The Summer Workshop of 1943.—One common interest of workshop participants was that of planning a post-war educational program. The workshop group carried forward the development of educational plans.

Another interest was that of planning courses, curriculums, student counseling, and administration to secure greater opportunities for students to discover the interrelations of their experiences in college and to realize the relation of these experiences to their living.

In addition to various special-interest groups, there were five regular groups in the workshop, namely: administration, humanities, science, social science, and student counseling. All participants and staff members assembled several times each week for discussion of problems of general interest. Various visiting lecturers and consultants shared in the work of the summer.

Members of the workshop staff included: Benjamin S. Bloom, evaluation and science; Paul J. Brouwer, student personnel and counseling; Harold B. Dunkel, humanities; Albert William Levi, social science; Ralph W. Ogan, director of the workshop and author of this progress report, administration; Richard I. Rush, science; and Ralph W. Tyler, evaluation.

Final Reports of the Study.—According to present plans, the official report of the Cooperative Study in General Education will consist of the following volumes:

1. A summary volume written by the Executive Committee, stating what it believes to have been the important findings growing out of the experience of the Study.
2. A report on the developments in science.
3. A report on the developments in the social sciences.
4. A report on the developments in the humanities.
5. A report on the developments in the field of student personnel.
6. Administrative organization and procedures helpful in promoting programs of general education.

Further information regarding the activities of the Cooperative Study, and on the materials that the Study has available for general distribution, may be obtained by writing the Cooperative Study in General Education, 5835 Kimbark Avenue, Chicago 37, Illinois.

Legal Provisions Relating to Pupil Personnel.—The U. S. Office of Education is studying legal provisions of the various

states relating to the school census, compulsory education, and child labor. The interest in pupil personnel problems as represented by these three fields has been sharply increased by certain specific questions pertinent to current problems in all states and for which each state desires the benefit of the experiences, as reflected in legal provisions, of other states. Examples of such questions are: Does the school census now have sufficient value for administrative purposes to warrant the expenses it entails? Is there a tendency to provide for a continuous rather than a periodic census? How frequently are periodic censuses taken? What duties are by law assigned to officials responsible for securing compliance with compulsory education provisions? What are the grounds for granting exemptions to compulsory education laws? What branches of state and local governments are responsible for the enforcement of child labor laws?

Legal provisions compiled on each of the three fields mentioned are being organized under significant headings in order to make it easy to compare, for any specific item, the statutory prescriptions of the various states. For the school census, legal regulations are being compiled, by states, on authorization, frequency, time of enumeration, appointment of enumerators, supervision of enumeration, prescription of forms and items, census age, enumeration of special groups, reports, and use made of census data.

For compulsory education, among the subjects included for treatment are: appointment and qualifications of attendance officers, forms used for enforcement, enforcement procedures, exemptions, compulsory school attendance age, and requirements relative to crediting attendance upon instruction at other than public schools.

In the field of child labor the investigation is concerned with what state and local agencies are made responsible by law for obtaining compliance with regulations governing employment of minors of school age, what officials issue work permits, what age group is subject to child labor regulations, and what procedures are designated to secure enforcement.

The compilation of statutory information has been completed and reports prepared covering each state. The cooperation of state departments of education is being secured for the verification of these reports and for any revision necessary to render them up to date.

Attitude Research. — A doctorate dissertation, entitled "A Comparison of Methods Used in Attitude Research," was completed in 1943 by Britten L. Riker at Princeton University.

Within the realm of social psychology the field of attitude measurement has expanded considerably in recent years. A consideration of present-day methodology in attitude research reveals that many different techniques of measurement are in use. The fundamental question posed is: Do these theoretically different techniques of attitude measurement yield different concrete results?

Before going into this problem, it is important by way of introduction to consider the general problem of measuring the opinion of groups. The initial requirement in attitude measurement is a simple but comprehensive technique of eliciting opinions. The attitude scale is seen as a method that satisfies this requirement, and which is capable of ordering attitude data for objective analysis and quantitative treatment.

A consideration of the scales now in use reveals that there are two chief methods of scale construction. The first method is termed the empirical technique. Here the units that comprise the scale are experimentally determined by using well-established psychophysical methodology. The second technique is the logical method. The scale categories of the logical scale are not derived empirically, but are assigned arbitrarily by the experimenter. Since logical scale construction does not require the great expenditure of time and effort that attends the construction of an empirical scale, logical scales are popular in attitude research, although very few data have been presented in the literature which compare the results obtained by the two methods.

The present study was conducted to make a more systematic appraisal of various scaling methods, to provide a wider setting than previously reported, and to make a deeper analysis of the problems attending the use of various scales in attitude measurement. Toward these ends three scales embodying the logical and empirical approaches were employed in a study of six social issues. It was hoped that this breadth of inquiry might give a comprehensive answer to the basic question posed as the object of this investigation.

From the evidence presented in this study, the conclusion follows that substantially equivalent results are obtained from the employment of empirical and logical methods. This evidence has been gained by means of two analytical approaches to the problem: (1) through the analysis of the distribution of responses obtained upon the comparison scales and (2) through an analysis of the correlations obtained among the responses given upon the measures.

Distribution analysis indicated that the two types of scales are similar in range and limits, and that representative units of empirical scales are equivalent to the categories of logical scales. Correlation analysis demonstrated that the similarity of the distribution derives from the individuals' making similar scores on the two types of scales. The extent to which the scores correlated was limited by errors of measurement found to attend the metrics. From a consideration of the findings indicated by this joint analysis, the conclusion is drawn that empirical and logical scales yield results which are essentially the same.

Indiana Projects.—The School of Education at Indiana University, through its Bureau of Cooperative Research and Field Service, has published several studies and continued the development of others during the past year.

An annotated list of current books and pamphlets dealing with the war was published early in 1943 under the title of *World War Information*. This list has been a valuable aid to teachers, students, and adult discussion groups in locating material dealing with facts and activities in the various war theaters.

Measures of motor fitness have been developed that are applicable both to college men and to army men. Early in the year a study, entitled *A Measure of Motor Fitness*, was published and later a second bulletin was published in which further studies of motor fitness were presented.

The analysis of arithmetic textbooks, which has been carried on for some time, has been completed so far as the actual analysis is concerned. Texts over a period of 150 years have been studied in five

50-year periods, and these separate analyses have been published as bulletins of the School of Education. The last two of these "period" studies have been released during the past year. A comparison of the findings in the study of these five periods will soon be ready for publication.

The Bureau has continued its cooperation with the Indiana state department of public instruction in making surveys of achievement in the public schools of the state and in developing high school tests for a state-wide annual testing program.

United States Armed Forces Institute.—The examinations staff of the United States Armed Forces Institute was appointed in April, 1942. The examinations it prepares will meet several purposes: (1) place members of the armed forces on their return to educational institutions; (2) grant appropriate credit for educational attainment while in military service; and (3) motivate the educational work of men in the armed forces.

The examinations staff has been directed to construct four types of examinations, only two of which are primarily to serve as a basis for placement and credit. The first type includes the tests given students at the completion of courses taken in the Institute. These are end-of-course tests and are used primarily to determine whether the student has mastered the work of the course and as a basis for awarding him a certificate for the completion of the course. The end-of-course tests are not generally to be used as a basis for placement or credit in school or college.

The second type includes subject or certifying examinations. Tests of this type are built to measure the man's competence to deal with the material commonly provided in high school or college courses or fields. For example, the subject examination in high-school physics covers the content commonly included in high-school physics and attempts to measure the degree to which the objectives commonly emphasized in high-school physics courses have been attained. On the basis of this examination it should be possible for a high school to learn how well the student has mastered the major elements of physics as this subject is commonly outlined in American high schools.

The third type of examinations is the tests of *General Educational Development*. Two batteries have been developed, one for the high-school level and the other for the college level. They have been prepared for immediate use in the placement of casualties returning to educational institutions. These tests include the kinds of exercises in the several subject fields that have proved to be good predictors of further success in these fields.

The fourth type of test will be of use only in certain individual cases. These are tests constructed specifically to measure the soldier's competence in certain highly technical fields of special military importance, such as ultra-high frequency electronics.

Research by the staff has been related to the identification of objectives for the types of tests described, the identification of the appropriate levels of difficulty for each of the types of examinations being constructed, and the study of forms of test exercises suitable to the diverse content represented. At least eighty examinations with additional alternate forms will be written.

The director of the examinations staff is Ralph W. Tyler, who prepared this progress report.

Effect of the War on Elementary and High Schools.—The U. S. Office of Education is making a study of the changes in several aspects of the school situation in order, on the one hand, to determine the effects on the schools of certain educational efforts during the war, such as the program of the High School Victory Corps, and on the other hand to disclose conditions that might call for remedial action on national and state levels, for example, the problem of teacher shortages.

The study is being made through the use of a questionnaire sent to all city schools, independent school districts, and county superintendents of schools. The questionnaire includes items on enrollment of elementary and high schools for 1942–43, number of new teachers in October, 1943, number of vacancies, methods used for preventing teacher shortages, and reasons for teachers leaving the schools. Special items concerning certain wartime activities are included: enrollment in preinduction courses and in wartime associated subjects, such as physics, chemistry, pre-flight aeronautics, mathematics, and industrial arts; enrollment in the various divisions of the High School Victory Corps; prevalence of lunch programs; and school gardens. The number of pupils of various ages, 15 to 21, is also requested.

The investigation will determine whether certain trends evident last year are continuing. Specifically the study will answer such questions as these: Is the high school enrollment continuing the drop first noticed in the year, 1941–42? Is the establishment of pre-flight aeronautics courses still on the increase? In October, 1941, in 2,148 school systems reporting, there were only 2,634 pupils enrolled in pre-flight courses, while in October, 1942, in the same school systems there were 35,515 pupils enrolled in such courses. Is this enrollment still increasing? How valuable has the idea of the High School Victory Corps been to high schools in their community war work? How successful has the school been in holding its 15-and 16-year olds in school?

This investigation will be interesting in showing the gross changes that have taken place in the student body, courses taken, and community services of the American school, especially the high school. It is believed that an important by-product of this report will be the disclosure that American school systems are adapted to meeting new needs. Their adaptability under the impact of war will be pointed to in later years to show what can be done when the schools find "a will and a way." The preliminary results of this study are being issued in *Education for Victory*. A full report will be made as soon as possible.